Volume 86
Number 26

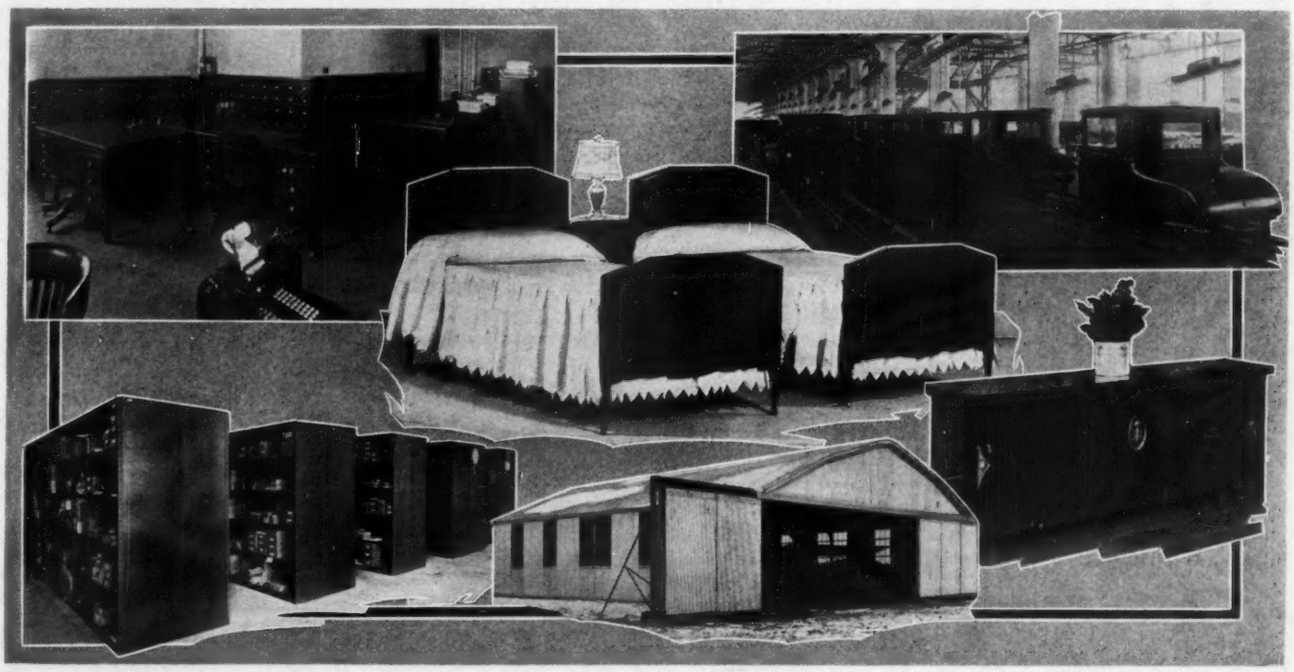
IRON TRADE REVIEW

Cleveland, O.
June 26, 1930

Sees Potential Steel Market of Over 161,000,000 Tons

Trade Research Division of National Association of Flat Rolled Steel Manufacturers Estimates Large Annual Tonnage in Ten Major Fields

A TOTAL of 161,113,340 tons of steel is the ultimate goal of the flat rolled industry in ten important consuming fields embracing office furniture, household furniture and equipment, automobile wheels and bodies, pressed and welded steel parts, shelving and bins, steel lath, steel buildings, building materials, electric light and telephone poles, and farm markets. This fact was revealed to executives of the flat rolled steel industry conducting their annual meeting at Hotel Greenbriar, White Sulphur Springs, W. Va., June 16-18, in a comprehensive report of surveys made by the trade research division of the National Association of Flat Rolled Steel Manufacturers, Cleveland. These vital statistics of potential markets are of major interest not only to manufacturers of steel but to their customers, the fabricators of steel products. They represent the results of a year's intensive study of steel consumption and of the possibilities of expanding



Office and household furniture, automobile wheels and bodies, pressed and welded parts, shelving and bins, buildings and building materials, electric light and telephone poles and farm equipment constitute large potential markets for the consumption of flat rolled steel

established applications. They do not embrace conjectures of tonnages that might be developed through the discovery and development of new uses for steel.

That the use of steel is increasing steadily is shown, for example, by the tendency in the building industry. Although building construction decreased 17.7 per cent in 1929 as compared with 1928, the use of flat rolled steel by this industry gained 36.6 per cent in the same time. In many other markets, the report of the division showed a constant and encouraging advance in the quantities of steel used. In bins and shelving, for partitions, in office buildings, in the home, for farm buildings, and for roofing the trend is distinctly upward. Altogether the markets which have been investigated by the research division offer opportunities for the sale of flat steel aggregating this tremendous total of 161,113,340 tons, with individual markets contributing to the tonnage as shown in the accompanying table. A summary of these figures shows a possible annual tonnage for flat rolled steel in these few markets of 8,179,465, or more than three times the present annual tonnage of 2,531,545. With these definite facts as an index of potential markets for steel as its background, the trade research division has inaugurated and proposes a continuation of an educational program to carry its message "Save With Steel" to consumers in nationwide markets through national and business paper advertising and through various dealer helps, as well as through its own magazine *Making Markets*.

How Individual Markets Contribute

	Total possible tonnage	Total possible annual tonnage
Office furniture	7,040,100	355,420
Household furniture and equipment	11,362,240	666,587
Automobile wheels and bodies	34,486,400	1,724,320
Pressed and welded steel parts	18,000,000	900,000
Shelving and bins	4,683,000	234,450
Steel lath	12,000,000	600,358
Steel buildings	13,322,000	686,100
Building materials	18,788,600	939,430
Electric light and telephone poles	3,956,000	197,800
Farm market (as covered in detail in 1929 report)	37,475,000	1,875,000
Total	161,113,340	8,179,465

The National Association of Flat Rolled Steel Manufacturers affords a splendid example of what a well organized, alert and aggressive trade association can do for its industry. It was organized primarily for service to the manufacturers of flat-rolled products, and it has performed that function well. But more than that—through the establishment of a trade research division—the association is creating greater consciousness for steel and at the same time broadening the uses for steel products. Obviously the steelmaker profits from the expanding markets, but likewise does the fabricator who finds his business growing under the stimulating influence of the association.

More recently the fabricators are co-operating with the steel industry to further the use of steel. To obtain the information on the ten fields just surveyed representatives called upon major fabricators in each division and spent considerable time in analyzing their sales possibilities. Fabricators were most helpful in giving the necessary information and revealed freely to the trade research investigators confidential sales figures and many intimate plans for business expansion.

Fabricators have expressed gratification at the interest which the steel industry is taking in their business. The president of one large company said. "It is encouraging to us to see the steel industry becoming so interested in the business of the fabricator, because we, after all, have to sell the use of steel to the public." One of the large fabricator's associations stated: "We individually and collectively greatly appreciate the work which your organization has done and is doing in studying the possibility for increased markets for our products."

Manufacturers Are Co-operating

Already scores of manufacturers of steel desks, office furniture, shelving, pressed steel, and other flat steel products are using the advertisements of the trade research division to inspire their salemen, dealers, and customers with the advantages of steel. To fabricators have been sent over 750,000 pieces of advertising at their own request. In the farm field, thousands of dealers have displayed enlarged reproductions of advertisements on steel roofing in their windows to tell the farmers their stores can help him protect his investments with galvanized sheets.

Many fabricators are sending out the entire series of advertisements although in many cases the particular product made by any one manufacturer may not be mentioned. One company making steel desks and office furniture sent an advertisement featuring household equipment and furniture to all of it dealers, telling them that this summary of the advantages of steel in the home was, at the same time, selling the business men of the country on the merits of steel equipment for office use. At the present time, 274 manufacturers are using the slogan "Save With Steel" in their own advertising. Many of these fabricators are shaping their whole selling campaigns around this slogan. Others are taking lessons from the division's messages and are showing how their steel products save fire loss, save weight, save time, and save space. In presenting this survey R. H. Griswold, president, the Griswold-Eshelman Co., Cleveland, made clear the fact that the research division of the National Association of Flat Rolled Steel Manufacturers is not in the business of selling steel and that its advertising campaign is not designed to produce inquiries for steel, the entire function of this body being to create a desire and an acceptance for steel products in all fields and markets. This group, he explained, sees the market for steel, not so much in the realm of the relatively few fabricators who turn the steel from the mills into a thousand and one finished and semifinished products as it is among the 4,000,000 people who are buying new automobiles this year. Markets for flat steel products are among the 20,000,000 homes where furniture is bought from time to time, in the offices where 6,000,000 workers are employed, and on the farms where live our 6,000,000 agriculturists. Steel must be sold to the 6000 architects in the United States who daily are choosing materials for building construction, to the designing engineers in 25,000 manufacturing plants, to contractors and to builders, in short, it must be sold to the 120 million peo-

ple who reside in the United States.

It is this broad gage viewpoint of the markets for steel that has dictated studies the division has made of the possible uses for steel on farms, in building construction, in homes, and in the other classifications shown in the preceding table. And in every study an effort has been made to answer the following five questions:

1.—What products offer the best chances for increased use of steel?

2.—How much steel is being used for those particular products today?

3.—What is the future possible market for steel in those products?

4.—What competition must be met by steel?

5.—What progress is steel making in maintaining and broading the use of those products?

Steel Needs Wide Sales Promotion

By Francis H. Sisson

Vice President, Guaranty Trust Co. of New York

ONE by one the leading industries of the United States have become aware of the need for certain changes in their methods to maintain their positions in the new economic environment in which they find themselves. This environment is characterized by an intense competition for markets, carried on partly through industrial efficiency, low costs and price inducements, but more largely through highly organized sales effort and efficient marketing methods. Business methods are changing to conform with changing conditions. Today, as never before, the producers and distributors of commodities and services recognize the importance of advertising, salesmanship, and the establishment of close and cordial relationships between buyer and seller.

It is not surprising that aggressive methods of sales promotion have been most freely used in those branches of business that are engaged in selling directly to the ultimate consumer—particularly those which are comparatively new and have had to build up their markets from the very foundation during the period in which such methods have been used.

Campaigns Develop Slowly

The hundreds of basic industries which are engaged in supplying standardized products that are not bought by individuals, but become the raw materials from which other products are made, have been comparatively slow to undertake extensive campaigns in the field of public relations. In steel, for example, immense progress has been made in productive technique; but comparatively little attention has been devoted to the problem of merchandising. Apparently, it has been supposed that a standard product like steel must compete mainly on a price basis and that the most important competition a steel company must face is the competition offered by other steel companies.

This illusion is gradually being dispelled. The need for modern distributive methods is not confined to those branches of business that are engaged in selling directly to the ultimate consumer. Markets, whether for producers' goods or consumers' goods, must be actively sought out. Not even steel, essential and widely known as it is, can sell itself and maintain its place in our economic system through its intrinsic merits alone. Steel producers, like the producers of any other commodity, will fall behind in the race unless their sales are promoted by modern, efficient and aggressive methods of distribution, analysis and development of markets, national advertising and the other devices utilized today by our progressive industries in disposing of their products. They must use every available means of stimulating demand. They must call to their aid not only the specialist in metallurgy, but the specialist in advertising and marketing. They must devote their attention not only to research in methods of producing better and cheaper steel, but also to research in new uses for steel.

These lines of effort are made necessary by the fact that steel manufacturers are forced to compete not only with other members of their own industry, but with the producers of other commodities as well. The same process is visible throughout our business fabric. In addition to the competition between individual concerns within the same industry, there is an even sharper competition between whole industries organized for the promotion of markets for their respective products.

Competition Has Always Existed

This type of competition is, of course, not new in the sense that a competitive relationship has never before existed between different commodities. Such competition has always existed. What is new is the acute realization on the part of business men that it does exist and the conscious effort to affect the competing desire of consumers in such a way as to create a demand for one product as against the products of other industries.

As business men became aware of the full implications of this competitive struggle, they began to organize for mutual protection, either by consolidation or by co-operative action among independent concerns. In this way the phrase "trade association"

Reiterates Principles of Trade Promotion

THE steel industry offers broad opportunity for aggressive co-operative trade promotion, particularly in those branches engaged in selling directly to the ultimate consumer. That possibilities in this direction are not being overlooked is evidenced by the dominant position which trade associations have assumed in the United States during recent years. In the accompanying article, portions of an address presented last week before the annual conference of executives of the flat rolled steel industry and fabricators of metal products, are outlined some of the essential factors in trade promotion. For more than five years the flat rolled industry has been engaged in an extensive trade research and promotion program based on these principles and the success achieved merits this reiteration of the fundamentals. The author, Francis H. Sisson, is vice president, Guaranty Trust Co. of New York.

has taken on a new importance in recent years. Competitors in each industry have been driven to take concerted action against competition from the outside.

The iron and steel industry is entering upon a new and different age. In the last 50 years the principal problem of the industry in the United States has been one of production. Small factories have been turned into large factories. Small farms operated with individual labor have given way to larger farms operated by power machinery. Iron and steel have been the chief tools by which this change has been made possible. Whenever anyone demands mass production, it calls for machinery and tools of steel. Under these conditions, the chief task of the steelmaker has been to satisfy the demand created by the natural trend of events in industry.

Mechanization Slowing Up

This trend is still continuing, but in the next 50 years it will not continue at the same rate of increase. Transportation has been mechanized by the coming of the automobile. The airplane will not equal the automobile as a builder of demand for steel. This means not only the education of the actual buyer of steel—that is, the man who uses steel in making his product; it involves a far wider program. The consumer who buys the product made of steel must be educated if the demand for steel is to be kept up.

Under these circumstances, it is essential to determine, first, in what fields steel is now being used; second, what the present tonnage is in these various fields; third, what is the future possible tonnage in these fields; fourth, whether this future possible tonnage can be influenced or increased by advertising and sales promotion work; fifth, what means and media should be used to effect this increase. Obviously, there are certain fields in which the use of steel will not be increased by promotion effort. Tack plate, from which carpet tack are made, for instance, is not a proper subject for promotion. Steel desks, on the other hand, are an item the use of which is subject to a great deal of development; and the rapidity of this development can be influenced by sales and advertising work.

There are other ways in which the main division of the steel industry can co-operate for their mutual benefit. So far, this work has been mostly confined to the cold steel industry—the makers of finishd products for consumption. In the case of the hot steel industry, the advantages to be gained by extensive advertising and sales efforts are, to be sure, less direct and less obvious. It is for this reason that the industry as a whole has been so slow to move. But the possibilities are there, and full advantages cannot be taken of them unless the basic producers of iron and steel unite their resources with those of the fabricators in promoting the welfare of the entire industry. Therefore, the hot steel industry, as an organized industry, might well take the initiative in enlisting the aid of steel fabricators and distributors in the development of new uses for steel products and in extending the market for them. There have been individual cases in which steel producers have acted toward this end, but they have been few. And there are natural limits to the process of sales promotion by individual companies. A manufacturer may well ask why he should bear a burden of general steel advertising that must naturally deposit a certain amount of business gratis at the doorsteps of his competitors. United action is the logical solution of the problem, and the degree of integration already existing in the hot steel industry should make the problem of organization comparatively simple.

The unmistakable trend toward the advertising of basic products to the ultimate consumer has an immediate bearing on the competitive problem that confronts the steel industry. New markets for finished products are springing up, and other products are making a strong bid for the place of steel in many uses. No one knows what the scientist and the engineer may produce in the way of new metals and other products. More than ever before, public sentiment will play a tremendous part in the prosperity of a steel manufacturer. More than ever before, the new uses of steel will directly appear to the average man and woman.

Advertising Important

The industry could take a greater interest in the technical schools and colleges and make an effort to encourage the training of engineers and architects in the use of steel. It could advertise its products to the general public and attempt to develop a national consciousness and appreciation of steel. It could conduct organized technical research to free the cold steel industry from the many restrictions and handicaps that have been imposed upon it by competitive influences.

Trade associations already exist in various branches of the cold steel industry, in addition to those just mentioned. Each of these should help to simplify the problem of unification. Not only could the members of these associations increase their sales by organized effort, but the hot steel industry could avail itself of their facilities in extending the markets for steel in all its multifarious uses, particularly those in which the most direct and active competition is encountered from other products.

Growth Depends On Markets

The output of steel, and hence the growth of the industry, depend upon the market for steel products. If this market is restricted or subjected to keen competition on the part of other materials, the output of the hot steel industry is likewise restricted and its growth is checked. This is exactly what has been taking place in recent years and what will continue to take place until the producers of steel are brought to a full realization of the necessity for co-ordinated action in the interests of the industry as a whole.

The steel industdy needs better salesmanship, national advertising, sales promotion, technical research, and all the other methods of market extension. It needs the practical merchandising methods and the sound sales policies that have been used so effectively by its competitors. But in the realization of these aims, the first problem is to obtain concerted action. It is not to be expected that any one concern will take the initiative unless the majority agrees on a program of constructive effort. No single company, for example, will continue to bear the entire expense of an extensive advertising campaign in order that others may reap the greater share of the benefits. The need is one that is common to all the makers of steel; the benefits will accrue to all; and the cost should be borne by all.

In closing, it may be well to add a word of caution. Bigger markets must be built upon a foundation of facts. The market for steel is a vast and complicated structure. Blind enthusiasm cannot add to it a single ton. Where is steel used now? In what quantities? Why is it used? How much of the possible market is sold? What are the factors retarding its growth? What competition must be met? Who must be influenced and convinced? These and a hundred other questions must be answered regarding each field to be developed.

Haffner Thrall Car Co., 140 South Dearborn street, Chicago, has changed its capitalization from $50,000 and 500 shares no par value to 1000 shares no par value.

Large Uses of Steel in Small Ways

169th Article—Incinerators

SHEET steel, angles, castings and wire are used in making household incinerators. Safe and substantial devices, replacing makeshifts, are finding a large market, supplying a new convenience for American homes

MANUFACTURERS of incinerators for household use estimate the annual production at 65,000, compared with about 20,000 two years ago. The incinerators vary in type and size, although each maker produces only one type and usually only one or two sizes. The weight of the incinerators averages 50 pounds and the annual consumption of steel in manufacturing them is estimated at 1600 tons.

Demand on Upgrade

Demand for incinerators is increasing as more families take pride in the appearance of their homes. From the improvised incinerator of a generation ago has developed the modern, carefully designed device for disposing of rubbish with a minimum amount of smoke, no danger of flying sparks, and no defacement of property. A small tonnage of wire and metal strips is used for incinerator baskets often seen in parks and public playgrounds.

Sheet steel generally is the principal material used in the manufacture of household incinerators, although the majority of modern types also employ malleable castings, angle iron and wire. One type, shown in the accompanying illustration, requires all of these. The drum, or body, of the incinerator is made of No. 20 gage black sheet, corrugated and galvanized after fabrication, with the top and bottom of special heat resisting steel. The drum is 25 inches high and 18 inches in diameter. Its capacity is two bushels.

The ash receiver is made of No. 26 gage black sheet, also corrugated and galvanized, with both top and bottom wired and swedged. The stand is made of angle iron, and the pivotal devices are malleable castings. These devices are bolted to the sides of the drum.

The height of the bottom of the drum from the ground, when the incinerator is assembled for use, is 40 inches and the total overall height is 65 inches.

To provide adequate draft while the rubbish is being burned the lower circumference of the drum, the bottom and one of the two top covers are perforated. The bottom is rigid while both of the covers are hinged. The top cover is used to protect the incinerator when not in use. The pivotal device enables the operator to shift the contents while burning and thus aid combustion. It also facilitates the emptying of the ashes.

THIS is the one hundred sixty-ninth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Belt Fasteners	*Washing Machines*
Sap Spouts	*Resilient Road Guards*
Flexible Conductors	*Screw Drivers*
Foundry Flasks	*Car and Bus Seats*
Teletype Machines	*Bathroom Cabinets*
Porch Furniture	*Lock Washers*
Telegraph Wire	*Steel Scaffolding*
Waste Receptacles	*Pavement Armor*
Chain Screens	*Torches*
Louvred Ventilators	*Ironing Machines*
Universal Joints	*Ball Bearings*
Rolling Doors	*Telephone Booths*
Messenger Call Boxes	*Springs*
Foot Guards	*Automobile Lamps*
Furniture Glides	*Power Lawn Mowers*
Luggage Racks	*Shovels and Spades*
Health Scales	*Twist Drills and Reamers*
Windmills	

Galvanize Embrittlement Is To Be Studied

Causes of occasional embrittlement of hot-dipped galvanized structural steel and the means for preventing the occurrence of this embrittlement will be investigated by a committee of the American Society for Testing Materials. A new group is being organized to carry out this research under the direction of committee A-5 on corrosion of iron and steel. The study was proposed by the sectional committee on zinc coatings of iron and steel, the problem having assumed special importance in the development of specifications for zinc coatings of structural steel shapes, plates and bars, and their products. Co-operation of leading galvanizing and structural companies is assured.

Officials of the Freyn Engineering Co. confer with Soviet representatives. From left to right: L. T. Shorley, secretary, and H. J. Freyn, president, Freyn Engineering Co., Chicago; P. A. Bogdanov, chairman, Amtorg Trading Corp., New York, and F. T. Kolgushkin, general manager, Kuznetskstroy

Shape Plans for Russian Steelworks

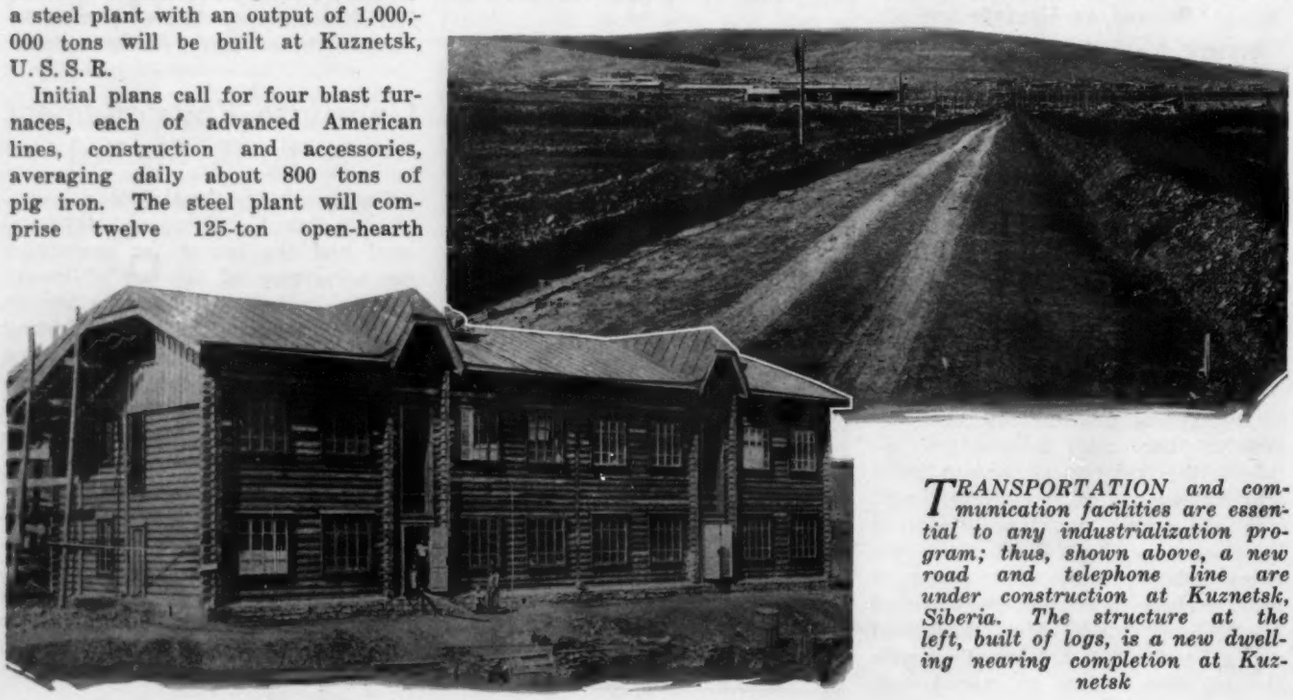
PROFITS in the industrial history of old Russia under the Tsarist regime were considered more important than modernization and maintenance of the plant. Labor was cheaper than progressive construction. In 1913 Russian steel plants were as backward as in 1905. In 1930, however, the Soviet Union proposes to build as of 1935 and in such manner as to maintain a lead of the times instead of a lag. As a step in this direction, and as reported briefly on Page 102 of the June 19 issue of IRON TRADE REVIEW, an agreement was concluded June 4 between the Freyn Engineering Co., Chicago, and the Novostal, the Soviet organization in charge of construction of new Russian steel plants, whereby a steel plant with an output of 1,000,000 tons will be built at Kuznetsk, U. S. S. R.

Initial plans call for four blast furnaces, each of advanced American lines, construction and accessories, averaging daily about 800 tons of pig iron. The steel plant will comprise twelve 125-ton open-hearth furnaces and blooming, rail, structural, continuous billet and plate mills. Four batteries of coke ovens will be erected and a power plant with a capacity of 96,000 kilowatts with all the auxiliaries required of a modern steel plant.

The works is to be located on the Tom river, about 220 miles south of the city Tomsk, Siberia. Preliminary work such as building roads, clearing the site, erecting dwellings, offices and temporary buildings has been in progress for over a year. Several thousand workmen now are engaged.

The terrain and climate about Kuznetsk are similar to North Dakota. The hills are rounded glacial, the summers warm and the winters cold and dry. The region is essentially a grain territory. Forests in the vicinity represent some of the world's few remaining stands of untouched timber. Copper, gold and coal mining operations are of long standing. The Trans-Siberian railroad crosses the north end of the Kuznetsk district, and the newly-opened 1000-mile Turk-Sib line, connecting the Trans-Siberian with the cotton and cattle raising territory of Turkestan, is adjacent on the west.

Iron ore is indicated in quantity, with iron content between 56 and 61.5 per cent. Kuznetsk coal has been worked for 30 years and affords the high grade of coke now used in some of the Ural mountain blast furnaces.

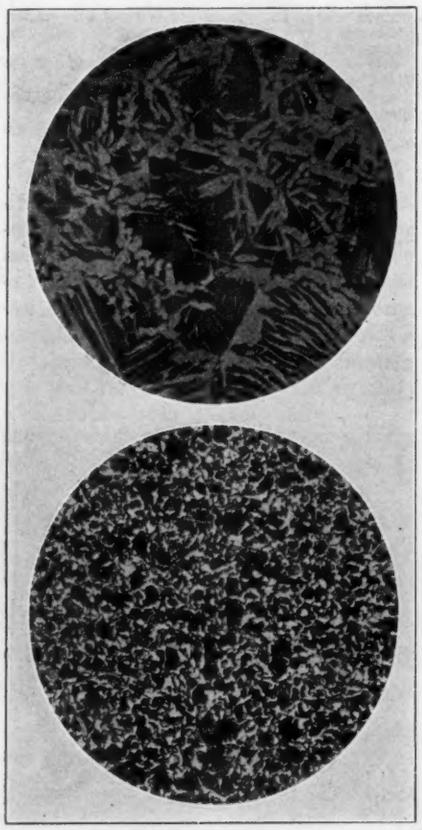


TRANSPORTATION and communication facilities are essential to any industrialization program; thus, shown above, a new road and telephone line are under construction at Kuznetsk, Siberia. The structure at the left, built of logs, is a new dwelling nearing completion at Kuznetsk

Develops Mixture for Purifying Carbon and Alloy Steels

Refining Material Added to Metal During the Tapping Operation Effects Uniformity and Homogeneity of Structure

PROGRESS of the steel industry can be measured in terms of increased quality. Values obtainable in carbon steels have been increased by the introduction and use of alloys in many combinations and the physical properties, both static and dynamic, of present-day steels, should more than satisfy design and service demands of modern engineering. Notwithstanding these higher physical values, the demand for cleaner steel and greater uniformity and homogeneity of structure continues. In fact, desired structure and minimum permissible inclusions rapidly are becoming a specification requirement.



Photomicrograph (top) of regular S.A.E. 1040 steel of 0.38 per cent carbon. X100. Photomicrograph (bottom) of treated S.A.E. 1040 steel of 0.38 per cent carbon. X100

The Refined Steel Products Co., Pittsburgh, after several years of intensive research has developed a refining process and a product which when added to molten steel reduces, serves to eliminate or control the solid nonmetallic inclusions and other deleterious constituents so as to modify the structural characteristics. The change in the characteristics gives to carbon steel values comparable to some of the alloy steels and further augments the present alloy steel values, or makes possible values higher than obtainable in the carbon steels by using lower alloy percentages.

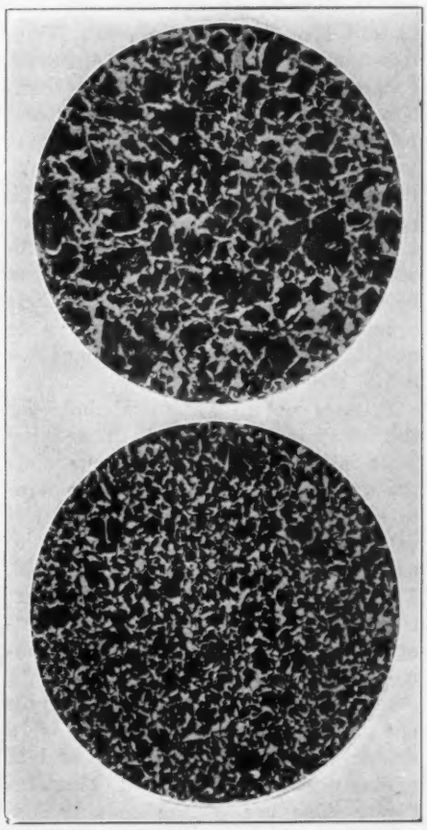
Many failures in service of both carbon and alloy steels can be traced directly either to lack of structural homogeneity or presence of solid nonmetallic inclusions which, when subjected to continued stress, fail at values far below standard for both dynamic and static stresses.

Alloys Function Individually

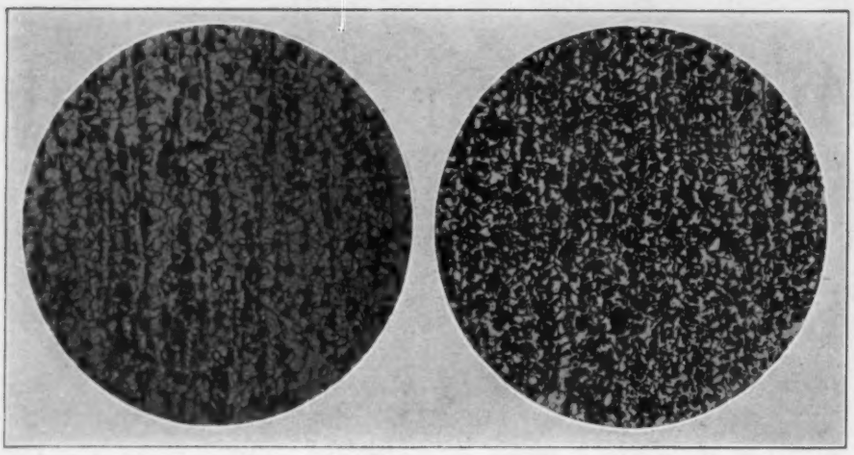
Proper credit must be given to the value of alloy additions to steel, each having their own particular function in producing structural characteristics either singly or in alloy combinations. Few if any combining alloys have any appreciable influence on the elimination of the solid nonmetallic inclusions. In fact, in the use of some alloys the end product of reaction may have a maleffect comparable to the constituent or condition which the use of the alloy had hoped to effect.

The refining material, known under the trade name of "Densite," consists essentially of an intimate finely-divided mixture of carbon and other chemicals. The material is packed in metallic containers and is added to the ladle during the tapping operation in quantities approximating 4 pounds per ton of metal. It must not be considered as a panacea to correct the evils of faulty practice. The modus operandi of the exothermic reaction, which takes place when this mixture is added to the molten steel in the ladle, is not known with certainty. It is believed, however, that the production of a rapid evolution and expansion of carbon monoxide acts as a propellant or a carrier to disseminate further the refining material throughout the molten metal. At the temperature and pressure of the reaction the finely-divided carbon and carbon monoxide have a definite reducing action upon the occluded oxides and serve an important and necessary function in purifying the metal.

When the initial force of the expanding gas has been dissipated and the refining material disseminated throughout the bath, the carbon mon-



Photomicrograph (top) of regular S.A.E. 1045 steel of 0.47 per cent carbon. X100. Photomicrograph (bottom) of treated S.A.E. 1050 steel of 0.48 per cent carbon. X100



Photomicrograph (left) of regular S.A.E. 1035 steel of 0.36 per cent carbon. X100. Photomicrograph (right) of treated S.A.E. 1035 steel of 0.35 per cent carbon. X100

oxide gas in rising to the surface creates an ebullition of the metal and in its upward movement augments the elimination of a major portion of the inclusions. The elimination of inclusions is attributed largely to the reactivity, that is, the tendency of some of the chemical constituents of the mixture to combine with the sonims in producing low-fusion eutectics. As a result, the products of reaction are much more fluid and of decreased surface tension which results in a more ready agglomeration and coalesence of the slag particles to and above the critical size. During the research work, photomicrographs were made of a large number of heats of steel to which the refining material had been added. It was necessary in many cases to go to the higher magnifications to show the presence of the inclusions.

These dispersed and relatively submicroscopic inclusions, as indicated at 3500 diameters, are regular in their orientation; they apparently serve as nuclei, and contribute to the modified grain structure.

Because of its structural influence the mixture when used in refining plain-carbon steels makes possible through heat treatment at temperatures lower than orthodox physical values and structures comparable to some of the alloy steels, it is claimed. These values may be augmented further by the use of alloys in percentages lower than the recognized commercial percentages.

The McQuaid-Ehn test, which serves as a standard of normality, is a definite measure of grain size and of grain growth at elevated temperatures. The use of the refining material is said to result in a definite and pronounced refinement of grain size and a marked tendency to resist grain growth at temperatures well above the Ac_3 point. A series of McQuaid-Ehn tests on carbon steels thus treated and of the carburizing range in each case indicated normal steels and grained structures of increased refinement and in many instances comparable to alloy steels.

Effects Crystallization

Etch and fracture tests of the treated carbon and alloy steels show that the primary crystallization of the metal is effected. Sections of large forgings show a uniformity of structure seldom obtained. Test bars taken from the center of locomotive axles forged from the top bloom of the ingot more than satisfy the tensile test requirements of the builder.

Banded structures in carbon and alloy steels refined with the material do not occur because of the influence of the refining mixture upon primary crystallization. For this reason these steels are particularly suitable for forgings where it often is difficult or impossible to break up the banded structure by subsequent hot working or heat treating of present-day steels.

The refining mixture makes possible the production of steels with a marked increase in physical properties, notably impact and fatigue values which will deliver under service conditions the degree of strength indicated by the tensile test bar.

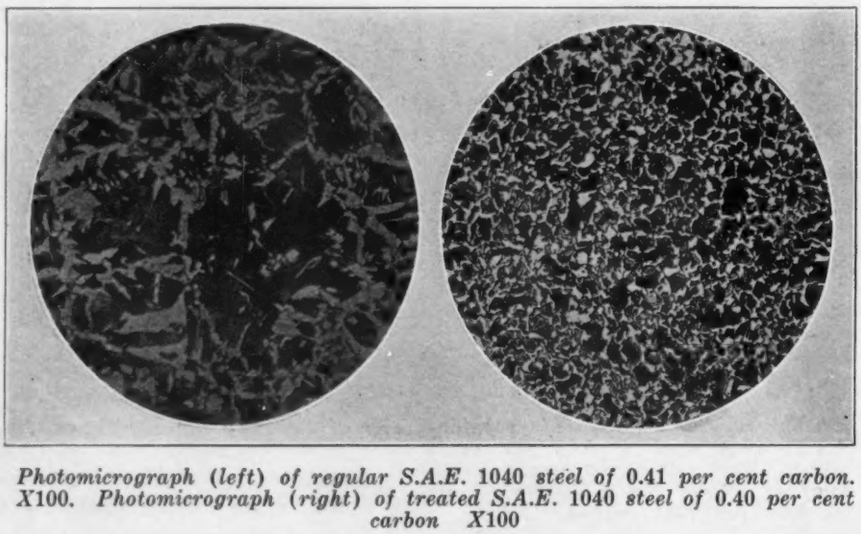
By modifying the structure, the refined steel will withstand drastic quenching operations. Round bars 1-inch diameter from a 0.48 per cent carbon heat, were quenched at 1800 and 2000 degrees Fahr. respectively in cold running water, drawn at 1000 degrees Fahr. and pulled with the following results:

Physical Qualities	Test No. 1	Test No. 2
Quenching temperature, degrees Fahr	1,800	2,000
Ultimate strength, lbs. per sq. in.	137,000	136,300
Yield point, lbs. per sq. in.	115,140	119,250
Elongation in 2", per cent	18.0	14.5
Reduction of area, per cent	50.1	38.4
Fracture	Full cup	½-cup

A more drastic test of the resistance to cracking under severe quenching was made on 1-inch round bars of S.A.E. 1095 steel. The bars were heated for one hour at various temperatures, quenched in cold running water, drawn at 1000 degrees Fahr., machined and pulled, giving the following results:

Physical Qualities	Test No. 1	Test No. 2	Test No. 3	Test No .4
Quenching temperature, degrees Fahr.	1,600	1,700	1,800	1,900
Ultimate strength, lbs. per sq. in.	181,250	173,150	163,000	163,400
Yield point, lbs. per sq. in.	138,000	138,200	137,400	136,500
Elongation in 2", per cent	11.0	9.0	7.0	6.0
Reduction of area, per cent	24.0	14.8	10.4	9.3

The fractures of refined steels indicate the metal to have inherent properties of greater interest and value than indicated by the values of the standard tensile test. The values are a cleaner steel with a more homogeneous modified grain structure.



Photomicrograph (left) of regular S.A.E. 1040 steel of 0.41 per cent carbon. X100. Photomicrograph (right) of treated S.A.E. 1040 steel of 0.40 per cent carbon X100

Steel Founders Adopt New Code of Standard Trade Customs

Standardized Sales Contract, Order Acceptance Form and Quotation Sheet Developed by Society To Fill Long-Felt Need

FOR some time considerable confusion has existed in the minds of both the buyer and seller of steel castings on certain specific questions such as: Is the steel foundry responsible for transportation charges on pattern equipment to and from the foundry? Is it customary for steel foundries to store inactive pattern equipment indefinitely without charging the customer? Is it the duty of the customer to see that proper methods are employed by the foundry to insure the production of satisfactory castings?

These and other questions which are answered by the general usages and policy of the steel foundry industry which have come down through the years, are clarified by the code of standard trade customs which recently have been completed by the Steel Founders' society of America.

Arbitrary Conditions Avoided

Only those practices which have come to be recognized generally as standard and in common use by most steel foundries have been included. No arbitrary conditions or rules have been set up prejudicial to either the buyer or seller of steel castings. The new code clearly sets forth the regulations and conditions under which steel castings are bought and sold.

There is nothing in the code which in any way regulates or standardizes prices or leads to price maintenance. It has been created solely for the purpose of securing uniform usage and definitely recording conditions of sales which will guide the buyers of steel castings and those producers who may not be acquainted with prevailing methods of conducting the business.

The standard sales contract which has been developed by the Steel Founders' Society meets a long-felt need of the steel foundry industry. On the reverse side of the contract form are printed the standard trade customs of the industry, which are made a part of the sales agreement.

In cases where the standard sales contract does not fit the conditions, a standard order acceptance form, which fulfils much the same purpose, has been provided for use in the industry.

The purpose of these trade customs is to clarify and define conditions generally accepted with respect to the purchase and sale of steel castings. Their careful observance by the buyer and seller will benefit both.

These regulations, recognized as standard in the steel foundry industry, should be made a part of all purchases and sales of steel castings, thus avoiding misunderstandings which in the final analysis always are unsatisfactory and frequently represent a loss, either to the customer or the foundry, that could have been prevented.

Imprint of Foundry's name and address

SALES CONTRACT

..... Place and Date

..... (Name of Foundry) sells and will deliver to

..... (Name of Buyer) and

..... (Name of Buyer) buys and will receive the product hereinafter described at the prices and on the terms and conditions hereinafter set forth.

DESCRIPTION, SPECIFICATIONS, AND WEIGHTS.
PRICE
TERMS
DELIVERIES
F. O. B.

CONDITIONS — Each shipment is to be a separate and independent sale for purposes of payment and settlement of claims. Fault in weight or quality shall not affect this contract with respect to other deliveries.

SPECIAL — This contract made subject to the further conditions printed on the reverse of this sheet which are hereby included and made a part hereof. Subject to acceptance at home office of seller.

ACCEPTED

..... (Buyer)
By

Date .....
(Fill out in duplicate)

..... (Seller)
By

..... (Buyer)

The standard sales contract and order acceptance form and quotation sheet are for the purpose of simplifying the transaction of business between the steel foundry and its customers. Their use helps to prevent losses, avoid possible litigation, and because of their fairness to buyer and seller, reduce disputes and delays to a minimum.

Standard conditions of sale, standard sales contracts and acceptance forms have been found to speed up commercial transactions, saving time and money and avoiding the misconstruing of terms, uncertainties, disputes and delays.

It is important that the *purchaser* as well as the seller of steel castings insist upon their use and observance.

Terms Are Set Forth

Standard Trade Customs:

A—All quotations are made and all steel castings are sold upon the following terms and conditions:

Quotations:

B—All requests for quotations shall give actual or estimated rough weights of the castings, but estimated weights shall not be used as a basis for billing.

C—All quotations on steel castings shall be exclusive of pattern equipment. The latter, if made by the foundry or requiring alterations, shall be an extra or separate charge to the purchaser.

D—Unless otherwise specified, castings are sold as unmachined castings. Terms—Net cash, 30 days from date of invoice, f.o.b. foundry.

E—When the quotations involve the making of piece prices, approximate weights shall be agreed upon and quotations shall be subject to revision on any variation from the original design.

F—Unless specified, any quotations

work, at an average price per pound, is furnished with the understanding that acceptance is for the entire lot, and quotations are good for thirty (30) days only and arrangements for pattern equipment shall be provided for within that time.

Pattern Equipment—General:

G—To eliminate errors patterns should be painted in accordance with the following standard practice:

Surfaces to be left *unfinished* are to be painted *black.*
Surfaces to be *machined* are to be painted *red.*
Seats of and for loose pieces are to be *red stripes on a yellow background.*
Core prints and seats for loose core prints are to be painted *yellow.*
Stop-offs are to be indicated by *diagonal black stripes on a yellow base.*

H—Patterns, coreboxes and loose pieces thereof shall be marked properly for identification.

I—All transportation charges on pattern equipment to and from the foundry shall be paid by the purchaser.

J—All packing and crating cost for transportation of patterns to and from the foundry shall be paid by the purchaser.

Responsibility Is Defined

Responsibility for Pattern Equipment:

K—Insurance against fire and the elements is the responsibility of the purchaser.

L—The foundry shall be responsible for loss or damage to pattern equipment only when due to careless handling or negligence on the part of the foundry, but not on account of fire or other causes beyond its control.

M—The foundry shall not provide storage space for patterns for which no orders have been received during a period of two years and notification shall be sent to customer for advice as to whether pattern shall be returned or destroyed.

Pattern Equipment Charges:

N—Subject to purchaser's approval, pattern changes or repairs which become necessary on account of ordinary wear shall be made at the purchaser's expense.

O—When the purchaser furnishes skeleton patterns, coreboxes, sweeps or conjunction patterns which increase the cost of production of castings, an extra charge will be made.

Changes, Alterations and Cancellations of Orders:

P—Changes in orders shall be confirmed in writing by the purchaser.

Q—Cancellations of orders must be agreed to mutually by the foundry and the purchaser.

Name of company and address

ACCEPTANCE OF ORDER

TO.....

.....

.....

We have received your order, ... dated ....., which we accept in accordance with the Standard Trade Customs of the Steel Foundry Industry, which are printed on the back hereof, and which are a part of this acceptance.

Very truly yours,

.....

BY:.....

Should occasion arise to write regarding this order, kindly refer to our No. .....

Liability, Claims of Error and Replacements:

R—All agreements are contingent upon fires, strikes, accidents or other causes beyond the foundry's control.

S—To be allowable, claims or error in weight or number of castings shall be made by the purchaser within ten (10) days after receipt of the castings.

T—The foundry shall not be responsible for machine work, labor charges or other expenses incurred on castings which are later rejected as defective.

U—Foundry is responsible only to the extent of replacing castings rejected due to defects in workmanship and material, and such castings must be reported or returned to the maker within a reasonable time.

Consequential, Special or Contingent Damages:

V—The foundry shall not be liable for consequential, special or contingent damages.

Specifications:

W—When chemical specifications, except phosphorus and sulphur, are imposed by the purchaser, the foundry shall not be held on physical tests and vice versa, except by agreement.

Arbitration:

X—Any controversy or claim arising out of or relating to a contract or the breach thereof shall be settled by arbitration, in accordance with the rules, then obtaining, of the American Arbitration association, and judgment upon the award rendered may be entered in the highest court of the forum, state or federal, having jurisdiction.

Co-operation:

Y—The foundry or producer will, whenever possible, arrange for the inspection of his plant equipment and product in order to acquaint the purchaser with the foundry problems and to assure him of the desire and advisability of close co-operation between them to the end that a quality product and best service may be furnished.

Steel Bridges Awarded Design Prizes

Selected as the most beautiful long-span steel bridge built in 1929, the Mount Hope bridge, erected by McClintic-Marshall Co., Pittsburgh, across Mount Hope bay between Bristol and Portsmouth, R. I., will receive the annual award of the American Institute of Steel Construction. The bridge was designed by Robinson & Steinman, engineers, New York, for the Mount Hope Bridge Co., and was opened to traffic Oct. 24, 1929.

The institute made two first prize awards, the first going to the most artistic long-span bridge and the other to the most artistic short-span bridge. The Mount Pleasant bridge, constructed by the Bethlehem Steel Co., Bethlehem, Pa., over the Harlem division of the New York Central railroad at Mt. Pleasant, N. Y., for the Westchester County Park commission, was judged to be the most beautiful short-span bridge of the year. Jay Downer, chief engineer for the park commission, designed the bridge, which was opened to traffic in March, 1929.

Honorable mention as the most aesthetic solution of a long-span bridge problem was given the Lake Champlain bridge, built by the American Bridge Co., New York, across Lake Champlain between Crown Point, N. Y., and Addison, Vt., and was opened to traffic Nov. 30, 1929. Fay, Spofford & Thorndike, engineers, Boston, designed the structure for the Lake Champlain Bridge commission.

The jury of award making these selections consisted of Gustav Lindenthal, consulting engineer, Jersey City, N. J.; Arthur Loomis Harmon, architect, New York; Hugh Ferriss, architect, New York; William H. Burr, consulting engineer, New York; Philip A. Cusachs, architect, New York, and Dr. J. Horace McFarland, president, Pennsylvania Art commission.

The Tri-City chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, G. A. Uhlmeyer, industrial engineer, Peoples Power Co., Moline, Ill.; vice chairman, R. E. McGee, chief metallurgist, International Harvester Co., Rock Island, Ill., and secretary-treasurer, Garnet Phillips, chemist and chief metallurgist, Frank Foundries Corp., Moline, Ill.

Electricity Makes Further Strides in Iron and Steel Industry

Iron and Steel Electrical Engineers Scan Progress of Past Year at Meeting Convention and Exposition at Buffalo, June 16-20, Are Attended by 1200

WITH attendance exceeding the thousand mark and a high degree of interest manifested in the numerous technical sessions, the twenty-sixth annual meeting of the Association of Iron and Steel Electrical Engineers was conducted at Hotel Statler, Buffalo, during the past week. Various divisions of the association participated in special meetings at which subjects relating to the field covered by each division were introduced and discussed. The electrical engineering, safety engineering, combustion engineering and the new wire and wire products divisions were those active.

New officers for the association, listed in an accompanying box, were elected at a business session in charge of F. W. Cramer, chief electrical engineer, Republic Steel Corp., Youngstown, O., president of the engineer's association throughout the past year.

In connection with the meeting an iron and steel exposition was held in Broadway auditorium, at which approximately 150 manufacturers of equipment displayed their products, many in operation. The exposition, an annual affair, occupied 50,000 square feet of floor space and was the largest from the point of space which the association ever has sponsored.

Members of the combustion engineering division spent Wednesday visiting the Steel Co. of Canada Ltd., at Hamilton, Ont., where a successful application of the use of mixed gases was examined. All engineering divisions, guests and exhibitors were invited on an inspection trip made to the Lackawanna plant of Bethlehem Steel Co., on Friday, June 20, the final day of the meeting.

Electrical Installations Show Steady Increase

ELECTRIFICATION of the iron and steel industry for 1929 was reviewed by W. H. Burr, electrical superintendent, Lukens Steel Co., Coatesville, Pa., and chairman of the electrical development committee of the association. Mr. Burr, for the past several years, has recorded progress made in the adaptation of electricity to mill purposes and his data for the past year reveal a steady increase in the installation of most types of mill motors, 1929 being a record year in regard to the total horsepower of motors installed on tube and piercing mills, rod mills, bar and billet mills, strip mills and reversing blooming mills. Mr. Burr concluded that the "phenomenal increase in the use of electricity in steel mills during the past 25 years has no doubt been one of the greatest factors contributing to the wonderful progress made by the steel industry. This increase is a direct result of the research policy established by manufacturers of electrical equipment."

"Shop Practices in the Iron and Steel Industry," a paper by J. J. Booth, electrical superintendent, National Tube Co., Gary, Ind., outlined a method of organization for a large steel plant with the electrical superintendent in complete charge, other operating departments coming under his direction. A carefully worked out system of reports was included as well as a method for checking stores and keeping account of what every department in the mill is doing. Mr. Booth prepared the material from replies to a questionnaire sent to a number of plants in the industry, and although the suggested shop practice appeared burdened with considerable detail, the size of the plant adopting the method would determine how much of the system could be used profitably.

Mill Lighting Is Topic

Much interest was shown in a paper on steel mill lighting problems, presented by R. F. Sanner, assistant to the electrical superintendent, Carnegie Steel Co., Duquesne, Pa. Mr. Sanner accompanied his paper with a number of lantern slides illustrating typical applications of high-bay mill lighting in Carnegie plants. Factors to be given attention in steel mill lighting, according to Mr. Sanner, are furnishing sufficient illumination; avoiding operator's eye strain; eliminating shadows and glare; facilities for turning lights on or off singly or in groups; an efficient light maintenance plan; and a suitable feeder and distribution system.

American interest in industrial Soviet Russia was attested by the large group which assembled to hear Gordon Fox, electrical engineer, Freyn Engineering Co., Chicago, discuss industrialization in the U. S. S. R. Mr. Fox only recently returned from an extended trip to Russia and in his remarks he attempted to answer many of the questions which often are raised by American manufacturers contemplating business with this foreign interest. Mr. Fox outlined the present 5-year industrialization plan which the Soviet is undertaking at a cost of $7,500,000,000. Methods of

financing this program, such as unusually heavy taxation of the people and large internal loans, were detailed by Mr. Fox who said that in his opinion the Soviet government was stable and would endure for some time to come, thereby allaying some of the fears of American business people who have extended credit to Russian buyers.

Furtherance of safety education in universities and engineering colleges was the subject brought up for discussion at the meeting of the safety engineering division. J. A. Voss, director of safety, Central Alloy division, Republic Steel Corp., Massillon, O., in a forceful paper, recommended the establishment of a course in safety in the technical curricula of colleges and universities. Mr. Voss pointed out that safety work is already a part of courses in some colleges in an indirect way. He proposed that a 2-year course, outlined by a specially selected committee of faculty representatives from various schools, be established for the proper teaching of safety work. His comments were received with great accord by those present and there was much agitation for definite steps in this direction although it appeared to be the general thought that principles of safety might be included in regular curricular work rather than being established as a separate course. Representatives from the National Safety council were present and told of educational safety work done in the public schools. At their suggestion a motion was passed unanimously expressing the approval of the safety engineering division of the work which the safety council is fostering, that of establishing safety instruction as a part of college technical training.

Coated Electrodes Advantageous

Advantages of a coated electrode in producing a superior type of weld were cited by J. B. Austin, research engineer, Una Welding & Bonding Co., Cleveland, in a paper, "Applying the Principles of Steel Mill Practice to Arc Welding." Mr. Austin showed that conditions at the tip of the electrode during arc welding resemble a small open-hearth furnace in operation and that carbon and manganese are burned out as the process continues. By means of an alloy coating on the welding rod these elements and others can be introduced into the molten metal, similarly as in the open hearth. Welded rail joint failures and proper methods of seam welding were described and illustrated on the screen, as were the successful welding of 18-8 chrome-nickel steel with a coated electrode and an automatic welding tool which feeds the electrode ahead as the weld progresses. Enhanced physical properties are produced in the weld by the coated electrode, according to Mr. Austin, the coating acting as a deoxidizer on the molten metal.

Furnace Design Discussed

At the first session of the combustion engineering division, G. R. McDermott, vice president and general manager, Chapman-Stein Co., Mount Vernon, O., read a comprehensive paper dealing with recent developments in industrial furnace design. Three major factors—improvement of quality of product as a result of superior heating, increased production and economy—were considered by Mr. McDermott in his comments on the radical changes in design of industrial furnaces employed for the reheating of ingots, blooms, slabs, billets and rounds in steel plants.

A symposium on open-hearth furnace control was a high spot of the combustion engineering program. The symposium was presented by R. W. Simpson, American Heat Economy bureau, Pittsburgh, and J. F. Shadgen, Smoot Engineering Co., New York. Representatives from a number of companies engaged in the manufacture of control instruments participated in the discussion which brought out many valuable points in regard to economical and accurate control methods for open-hearth furnaces.

Antifriction bearings for mill-type motors, general purpose motors and electric overhead traveling cranes were reported on by a special committee on bearings under the chairmanship of F. D. Egan, electrical superintendent, Bethlehem Steel Co., Lackawanna, N. Y. The report consisted of a number of data sheets listing bearing types, sizes, specifications and other data for various types and capacities of motors and cranes. Later work by the committee will include an investigation of antifriction bearing applications to mill roll necks, a subject which came in for some discussion at the conclusion of the committee's report.

Interest in wire and wire products was signalized by the large audience attending the meeting of this division. Three papers were prepared for presentation at the session. Observations of European rod drawing practice as revealed by a recent trip through European wire mills were presented by Kenneth Lewis, vice president, Morgan Construction Co., Worcester, Mass. Comments on latest designs in wire drawing, wire forming machinery and equipment were made by C. S. Arms, consulting engineer, Sleeper & Hartley Inc., Worcester, Mass. Wire galvanizing was considered by W. H. Spowers Jr., consulting galvanizing engineer. New York. Two moving pictures were featured at this session also, one showing the making of steel wire and the other portraying the story of monel metal.

Crane Specifications Proposed

Concluding technical sessions were held Thursday morning. Executives, engineers and crane builders met to discuss proposed specifications for electric overhead traveling cranes, drawn up by the Association of Iron and Steel Electrical Engineers. Specifications relate to erection, materials, interchangeability, accessibility, safety devices, clearances, bridge girders, cabs, trolleys, drums, ropes, sheaves and equalizers, rails, bearings, gears and many other integral parts of the construction of electric overhead cranes, 48 in all.

Variety of Steel Mill Equipment at Exposition

STEEL mill equipment, machinery and accessories comprised the major share of products shown at the iron and steel exposition held in Broadway auditorium, Buffalo, in conjunction with the annual meeting of the Association of Iron and Steel Electrical Engineers. One hundred and forty two manufacturers occupied the 50,000 square feet of floor space in the auditorium and many had exhibits in actual operation. Colorful displays making generous use of novel lighting effects characterized the show in general.

Electrical equipment was, of course, predominant. Control panels, switchboards, relays, motors, crane controls, switches and other electric mill units were displayed prominently by General Electric Co., Schenectady, N. Y.; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Westinghouse Lighting institute, New York; Allis-Chalmers Mfg. Co., Milwaukee; Century Electric Co., St. Louis; Crocker-Wheeler Electric Mfg. Co., Ampere,

N. J.; Cutler-Hammer Inc., Milwaukee; Reliance Electric & Engineering Co., Clark Controller Co., and Electric Controller & Mfg. Co., Cleveland; and Square D Co., Detroit.

A group of manufacturers exhibited meters of various types such as flow meters, recording pyrometers and other indicators. Among these were the Bailey Meter Co., Cleveland; Bristol Co., Waterbury, Conn.; Brown Instrument Co., Philadelphia; Leeds & Northrup Co., Philadelphia; Republic Flow Meters Co., Chicago; and Shallcross Control Systems Co., Milwaukee.

Cranes, hoists and crane trolleys were shown, either by working models of or by means of typical installation views, by several interests, including Cleveland Crane & Engineering Co., Wickliffe, O.; Milwaukee Electric Crane & Hoist Corp., Milwaukee; Alliance Machine Co., and Morgan Engineering Co., Alliance, O.; Chisholm-Moore Hoist Corp., a division of Columbus-MacKinnon Chain Corp., North Tonawanda, N. Y.; American Engineering Co., Philadelphia; and Yale & Towne

Bearings Are Featured

Among the bearing manufacturers featuring displays of their products, both the ball and roller types, were Timken Roller Bearing Co., Canton, O.; Hyatt Roller Bearing Co., Harrison, N. J.; Fafnir Bearing Co., New Britain, Conn.; New Departure Mfg. Co., Bristol, Conn.; Transmission Ball Bearing Co., and Lumen Bearing Co., Buffalo; Rollway Bearing Co. Inc., Syracuse, N. Y.; Norma Hoffman Bearings Corp., Stamford, Conn.; and Orange Roller Bearing Co., Orange, N. J. American Manganese Bronze Co., Philadelphia, exhibited a number of types of heavy bronze bearings.

M. H. Detrick Co., Chicago, showed several adaptations of suspended furnace arches. Among refractory exhibitors were Botfield Refractories Co., Philadelphia; and Johns-Manville Inc., New York.

Industrial trucks, cars and other material handling units were exhibited by Atlas Car & Mfg. Co., Cleveland; Baker-Raulang Co., Cleveland; Electric Storage Battery Co., Philadelphia; and Wright-Hibbard Industrial Electric Truck Co. Inc., Phelps, N. Y.

Aluminum Co. of America, Pittsburgh, showed a number of rolled aluminum busbars together with other aluminum parts, cast and rolled. Rolling mill machinery was featured at the exhibit of United Engineering & Foundry Co., Pittsburgh. Farrel-Birmingham Co. Inc., Buffalo, displayed several type of gears. Morgan Construction Co., Worcester, Mass., had a complete wire mill in operation.

Lincoln Electric Co., Cleveland, displayed welders and all-welded motors. Sleeper & Hartley Inc., Worcester, Mass., arranged an interesting demonstration of wire forming machinery in actual operation. Self-aligning couplings were exhibited at the booth of Bartlett-Hayward Co., Baltimore.

Lighting fixtures, signal devices and lights, flood lights and illuminating specialties were displayed by the Thompson Electric Co., Cleveland; Benjamin Electric Co., DesPlaines, Ill.; Holophane Co., New York; Nichols-Lintern Co., Cleveland; and Pyle National Co., Chicago. Steel & Tubes Inc., Cleveland, displayed electrical conduit which it manufactures by a special welding process.

Erie Steel Construction Co., Erie, Pa., displayed a special type of bucket recently developed by the company, with self-contained motor drive. Industrial furnaces with special electrical elements were operated at the booth of Globar Corp., a division of the Carborundum Co., Niagara Falls, N. Y.

William B. Pollack Co., Youngstown, O., featured an attractive pictorial display of ladle cars, blast furnace shells and other riveted and welded steel plate work which it has installed in various steel plants.

Texas Co., New York, arranged a display of steel mill lubricants which it handles, including oils, greases and other petroleum products. Pennsylvania Lubricating Co., Pittsburgh; Hodson Corp., Chicago; Trabon Lubricating Equipment Co., Detroit; Keystone Lubricating Co., Philadelphia; and Ironsides Co., Columbus, O., also exhibits lubricating materials.

Otis Elevator Co., New York, showed corrosion-resisting castings with surfaces machined smooth. American Air Filter Co., Inc., Louisville, Ky., showed several types and sizes of air filters. Cleveland Worm & Gear Co., Cleveland, exhibited speed reducers. Nukem Products Corp., Buffalo, showed a steel pickling tank with special acid-resistant lining. Power drives, couplings and speed reducers were featured at the exhibit of Morse Chain Co., Ithaca, N. Y.

New Officers Elected

ASSOCIATION OF IRON AND STEEL ELECTRICAL ENGINEERS

President

ROLAND M. HUSSEY
Superintendent of wire mills, Jones & Laughlin Steel Corp., Aliquippa, Pa.

Vice presidents

F. O. SCHNURE
Bethlehem Steel Co., Sparrows Point, Md.

J. J. BOOTH
National Tube Co., Gary, Ind.

Treasurer

JAMES FARRINGTON
Wheeling Steel Corp., Steubenville, O.

Secretary

W. E. MILLER
Bethlehem Steel Co., Johnstown, Pa.

Director-at-Large

FRANK D. EGAN
Electrical superintendent, Bethlehem Steel Co., Lackawanna, N. Y.

Directors

N. C. BYE
Henry Disston & Sons Co., Philadelphia.

E. C. WINFIELD
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

J. H. VANCAMPEN
Republic Steel Corp., Warren, O.

WRAY DUDLEY
National Tube Co., Pittsburgh.

F. W. ACKER
Inland Steel Co., East Chicago, Ind.

J. A. VOSS
Republic Steel Corp., Massillon, O.

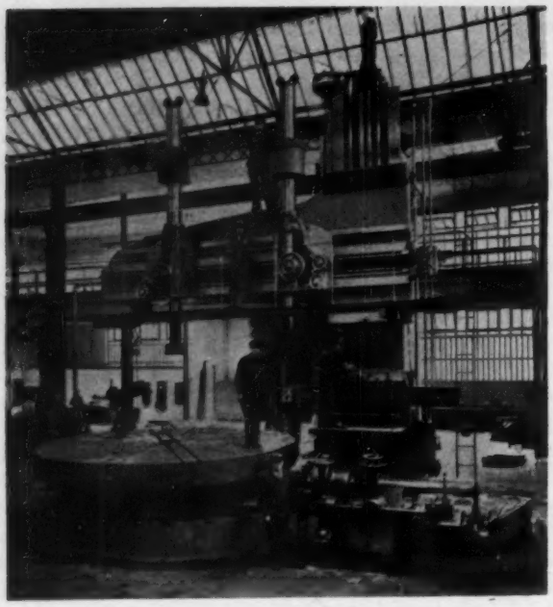
W. W. FLANAGAN
Carnegie Steel Co., Pittsburgh.

Welding To Be Used on Tall Texas Building

Construction of what is claimed to be the tallest 100 per cent electrically welded building is now under way at Dallas, Tex., where the 19-story building of the Dallas Power & Light Co., Dallas, Tex., is being erected. The new structure is to be used as an office building. The excavation for the structure has been completed and the footings set since construction began, on March 15, and the first steel is expected on the job by July 1. Steel fabrication and erection will be done by the Mosher Steel & Machinery Co., Dallas, using welding equipment manufactured by the General Electric Co., Schenectady, N. Y.

Dallas is the largest city in the United States to sanction, in its building code, the use of welding in the construction of buildings. At the present time, 79 cities are known to have adopted codes which allow welding and almost all of these are in the south and west. Pittsfield, Mass., Wilmington, Del., Lynn, Mass., and Syracuse, N. Y.; are the only eastern cities which have taken this step. Despite this fact, the greater number of welded buildings are in the eastern part of the country, although the building codes do not nominally allow welding. A recent compilation shows over 50 buildings already built by welding or in the process of erection and about 80 per cent of these are situated in the eastern part of the country.

Labor disputes increased in 1929, but the number of persons concerned was smaller than in any other year since the bureau of labor began compiling records in 1916. Forty per cent of the disputes were settled in favor of employers, 29 per cent in favor of employes and 25 per cent were compromised.



HEAVY - DUTY vertical lathe or horizontal faceplate mill, a French product, in which the table can be displaced on the bed, providing a turning diameter up to 35 feet

Vertical Lathe and Planer Are Tools of French Design

ILLUSTRATIVE of modern principles of design in heavy-duty machine tools of French manufacture are the two machines illustrated on this page, a vertical lathe, or horizontal faceplate mill, shown above, and a large planer, shown below. The machines were designed and built by Etablissements Charles Berthiez, 44 Rue Lafayette, Paris, with works at Lille (Nord). It will be interesting to compare the features of these machines with those of the large machine tools of German design, described in an article on Page 43 of the Feb. 20 issue of IRON TRADE REVIEW.

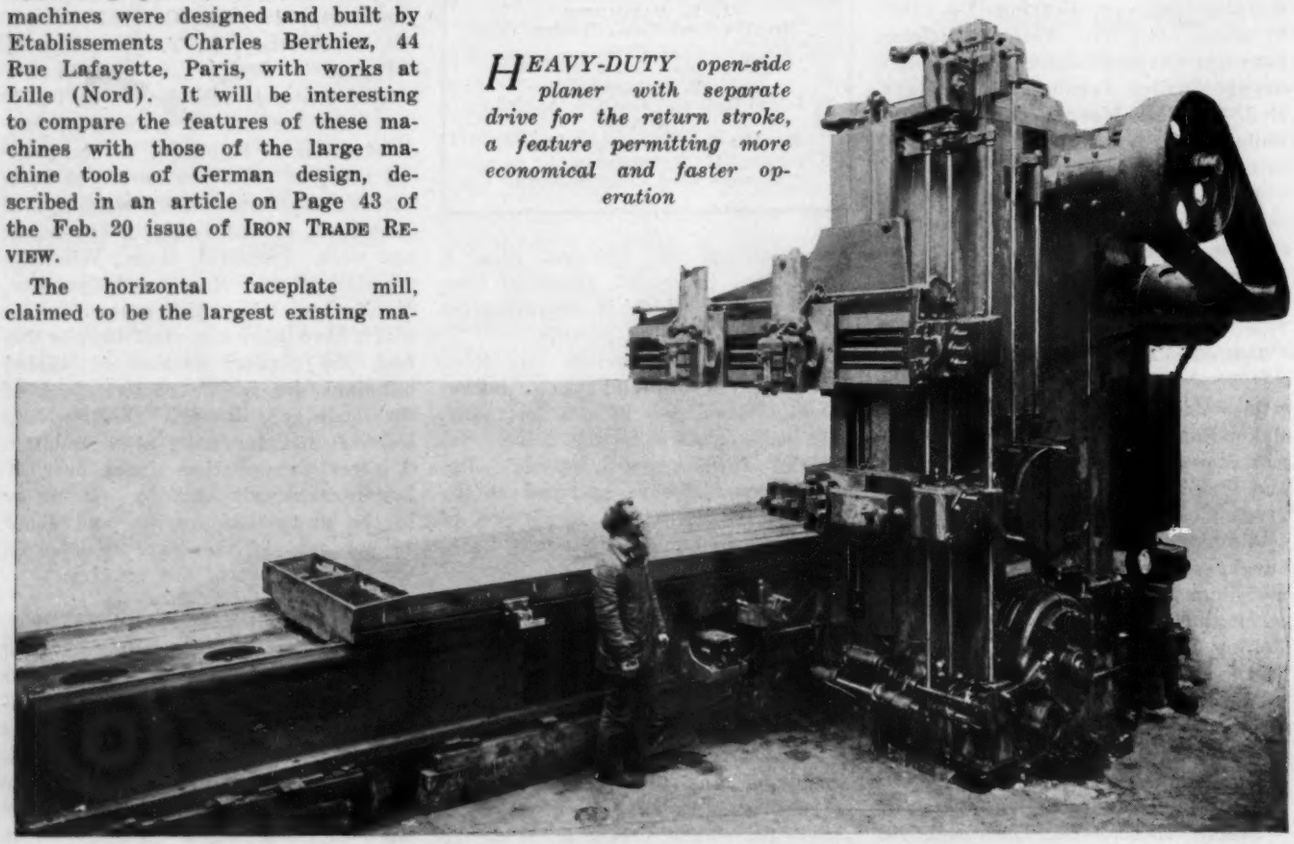
The horizontal faceplate mill, claimed to be the largest existing machine of its kind with a single column, has been constructed especially for machining large turbine parts. The table can be displaced horizontally, permitting the turning of parts greater in diameter than the table. The bed may be installed below the actual floor level and thus the extension used when turning parts of large diameter may be covered over when not in use. This arrangement is apparent from the accompanying illustration. Drive is through conical gears which give a precision of 0.02 millimeter per meter of diameter of the part to be turned. The arm is guided by two slides, one V-shaped, the other flat and used as an additional support.

Control stations for the electrical operation of the machine are provided on the tool carrier, on the gear box, at the end of the bed and at the end of the arm. Electrical equipment includes five constant-speed motors, aggregating 120 horsepower; one motor is used for the main drive, one for the displacement of the arm, one for the rapid displacement of the tool carrier, one for the displacement of the table and one for supplying lubricant under pressure. All speed changes, numbering 18, and feeds, 12 in all, are obtained through gear boxes.

Principal dimensions and specifications are: Normal diameter turned, 23 feet; height of turning, 14 feet; maximum diameter turned after table is displaced, 35 feet; weight of the heaviest piece capable of being turned, 85 tons; weight of machine, 120 tons; weight of column, 45 tons.

The planer is the single upright or open-side type; it will plane ma-

HEAVY-DUTY open-side planer with separate drive for the return stroke, a feature permitting more economical and faster operation



terial 1.8 meters in width, accommodate a height of 1.5 meters, and has a table width of 1.5 meters. The stroke is 4.0 meters with cutting speeds varying from 9 to 30 meters per minute. A return speed of 60 meters per minute is provided, controlled through a separate source of power from the main drive motor which is 25 horsepower in capacity. The main source of power moves continuously in the same direction and is engaged only when cutting.

The use of this separate motor drive for the return stroke is a patented feature and is said to result in considerable saving in net power required with the advantage of additional operating speed. The planer has been arranged for either belt or motor drive, a separate pulley being used for the return stroke mechanism in the case of the belt-drive design.

Booklet Surveys Steel Castings Industry

To get detailed information of the steel castings industry, the Steel Founders Society of America has conducted an exhaustive industrial census, supplementing the work of the department of commerce, and has published the results of this survey in a 170-page booklet entitled, 1930 *Directory of Manufacturers, Steel Castings, Heat and Corrosion Resisting Castings in the United States and Canada.* The publication gives the capacity, equipment and production data for 260 foundries in the United States and Canada including all but a few foundries which have negligibly small capacity and output. The questionnaires sent out by the society called for data on average number of employes, capacity, production of carbon, alloy and heat and corrosion resisting castings, number and types of furnaces used and other information thought to be valuable to executives of steel foundries.

It was found that while 1929 was a good year compared with previous figures, it fell far short of utilizing the full existing capacity for steel casting production. Actually, only 68 per cent of the capacity was required to fill the demand. Active research for new markets and new uses for steel castings is being undertaken by the society in an effort to bridge the gap between supply and demand. Occasional new foundries starting up increase this difficulty as they must secure their outlets from established sources which are operating below capacity. Progress in the whole industry is being made and the outlook is for increased demand under better operating conditions. Copies of the directory may be obtained from the Steel Founders Society of America, 932 Graybar building, New York.

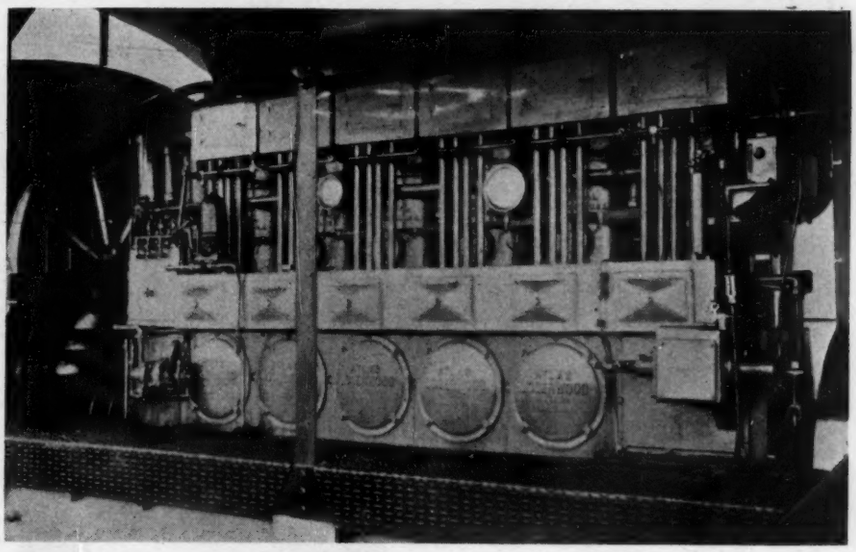
Power Company Given Charles Coffin Award

Development of a system of interconnection which allowed the company to produce more power at less cost and other engineering improvements benefiting both the company and its customers has won for the Public Service Electric & Gas Co., Newark, N. J., the Charles A. Coffin Foundation award which was presented at the annual convention of the National Electric Light association at San Francisco, June 19. The honor, awarded annually to that central station company which has done most of the advancement of the electrical art, was established by the General Electric Co., Schenectady, N. Y. With the award goes a check for $1000 to be placed in the treasury of the company's mutual benefit association.

The interconnection system permitted the company to produce 65,000,000 additional kilowatt-hours of energy in 1929, compared with 1928, at a decrease in cost of $565,000; and the benefit was passed on to the customers in lower electric rates. The central station company also has conducted researches in several fields, and the results of the investigations have been given to the profession at large through publication of papers in technical society journals.

The famed Pillar of Delhi is a shaft of pure wrought iron erected about 400 A. D. and today one of the leading sights of the Indian city.

Nonskid Floor Plates Provide Protection on Diesel Yarders



LARGE diesel engines mounted on trucks are used to supply power for temporary operations in the lumber regions of the Pacific Northwest. These portable power plants, or yarders as they are called, are used in all kinds of weather and as the platforms on which the operators must work are about 8 feet above the ground, possibilities for serious accidents are presented when rain, snow, sleet and ice, as well as oil from the engine, make the footing on these platforms precarious.

A satisfactory remedy in overcoming the hazards was the employment of nonskid steel floor plates made by the Central Iron & Steel Co., Harrisburg, Pa. These plates are the same as those used widely in industrial plants, bridges and other public structures. In numerous cases the new type floor plates are being provided on old machines. A typical installation is shown in the accompanying illustration. It is interesting to note that the plates were flanged to an angle of 45 degrees, this operation being performed cold and without distortion.

Employment Protection Plan Is Devised by General Electric

Applies System for Averting Unemployment, with Guarantee of Compensation in Event of Layoff—Contributes Half of Fund

A DOUBLE-BARRELED plan to protect workers against unemployment and its consequences, of interest to all industry, has been announced by Gerard Swope, president, General Electric Co. Unemployment insurance plans have been suggested and studied for years by industrial leaders in the hope of solving a distressing problem.

While the proposal is not referred to as an insurance plan, because it is broader in scope, it guarantees employes specific amounts in the event of unemployment. The company employs more than 50,000, and is one of the largest industrial groups ever to try such a system. Many of the provisions are an outgrowth of suggestions from leading workmen. The money is to be raised through equal contributions by the employes and the company.

At the same time Mr. Swope announced a plan for the stabilization of employment by reducing to a minimum the cause and effect of unemployment. Rules are set down for all factories as to what to do and what not to do when business is either on the increase or work is falling off.

Any Employe May Adopt Plan

The unemployment plan may be adopted by any workers, regardless of the action of the other plants, and the company will participate upon an affirmative vote of 60 per cent or more of the eligible employes of that works. Any employe with continuous service with the company of one year or more is eligible for membership. By enrolling the participant agrees to pay into a trust fund created by the plan approximately 1 per cent of his actual weekly or monthly earnings for a period of three years, but only so long as his earnings are 50 per cent or more of his average full time weekly or monthly earnings.

In abnormal times of unemployment, normal contributions by participating employes would cease and all employes would be called upon to contribute. In other words, employes who are subject to layoffs would aid themselves as much as possible, and when they

Gerard Swope's Rules for Preventing Unemployment

When Business Is Increasing—

1. Increase working force by adding employes as slowly as possible.
2. Increase the number in especially busy departments by transfers from other departments.
3. Resort to overtime in particular departments and generally before increasing the working force.
4. Postpone plant renewal and maintenance work as much as possible, employing the men on regular production.

When Work Begins to Fall Off—

1. Cease hiring at once.
2. Cut out all possible overtime and bring departments down to the normal week.
3. Transfer people from slack to busier departments.
4. Stimulate sales department to obtain business for future delivery.
5. Build standard apparatus for stock up to (*) months' shipments, based on average of last three years, sales, adjusted to expectation of next two years.
6. See that stocks at all factory and district warehouses are brought up to this maximum.
7. Use men on maintenance and repair work, bringing the plant and equipment up to a high standard.
8. Cut the normal week as generally and gradually as possible, by departments, down to 50 per cent of the normal week.
9. Proceed with construction of increased plant facilities previously planned, using our own men as far as possible.
10. Drop new employes with less than one year of service, single people with no dependents and who are most easily spared first, always with not less than one week's notice.
11. In accordance with our custom established for some time, employes should be told whether it is a temporary layoff due to lack of work, or permanent layoff, and in every instance of permanent layoff, the usual compensation, if any, should be paid, depending upon character of work, age and length of service.

GERARD SWOPE

*This figure varies.

could no longer do this, then those employes who are still working would contribute toward the aid of the men who are laid off. The company itself would contribute in both instances to an equal extent to that of the participating employes.

According to the plan, up to 3 per cent of the contributions paid into the trust will be available for the relief of employes or former employes in need; up to 27 per cent of the normal contributions will be available for loans to employes who are members and the balance, approximately 70 per cent of the normal, with all emergency contributions and all interest on the funds will be available for unemployment payments.

The trust which will handle the funds will be in charge of a board of trustees, and the company will guarantee 5 per cent interest. The company also will pay the administration expenses for the first two years.

The plan will operate separately in each works, and its adminstration in each works will be vested in a board of not less than four or more than 16 members, one half of which will be elected by the participating members and the other half appointed by the company. No payments will be made from the fund for at least six months after its creation and thereafter only to employes who have made normal payments for at least six months.

Limits Are Established

Payments to contributing employes, who receive notice of a temporary layoff, will be 50 per cent of their average earnings for full time but in no case more than $20 per week, and such payments shall not exceed ten weeks in any 12 consecutive months. When an employe is working part time and receiving less than 50 per cent of his average full time wage he may be eligible for payments amounting to the difference between the amount he is receiving as wages and the maximum he might be entitled to under the unemployment plan.

Should an unemployment emergency arise at any particular works, when payments from the fund are 100 per cent or more of the average normal receipts, then all employes of this works, whether participants in the plan or not, and including the highest officers of the company connected with the particular works, will be called upon to contribute approximately 1 per cent of weekly or monthly earnings.

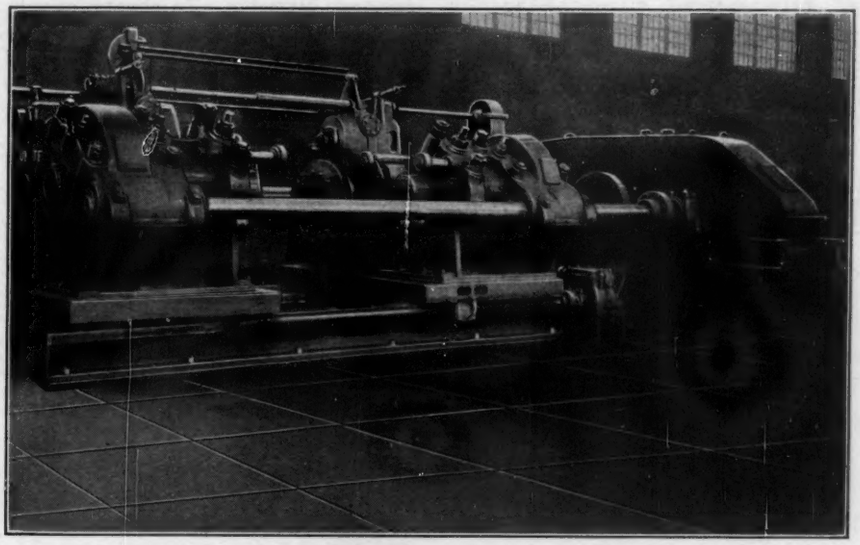
Also in such an emergency, all the general and district commercial men, general manufacturing, engineering and administrative employes of the company at all works and offices in the United States not on a particular works payroll, shall contribute their proportion to the fund.

This proportion shall be determined by the ratio of the average earnings of the contributing employes of the particular works to the total payroll of the eligible employes of all works of the company. For example, if the Schenectady works should adopt the plan and the average earnings of its contributing employes should be 20 per cent of the total payroll of the eligible employes of all works, then 20 per cent of 1 per cent will be contributed to the fund. Thus an office employe receiving $2000 per year would be called upon to contribute $4 per year. The company will contribute dollar for dollar to all such moneys added to the fund. After the emergency is over, normal payments to the fund by participants will be renewed.

New Finish Will Benefit Metal Fabricators

A new monel metal finish, designated No. 8, has been developed by the Huntington mill of the International Nickel Co. Huntington, W. Va., to eliminate the need on the part of fabricators for further polishing of products after manufacturing operations are completed. The new finish, which replaces the Nos. 3 and 4 finishes, has a silver-satin appearance with more luster than both the latter but without the high reflectivity of the No. 5 full finish. It is adapted to kitchen sinks, where its satin surface can be maintained more easily than one with a mirror-like luster.

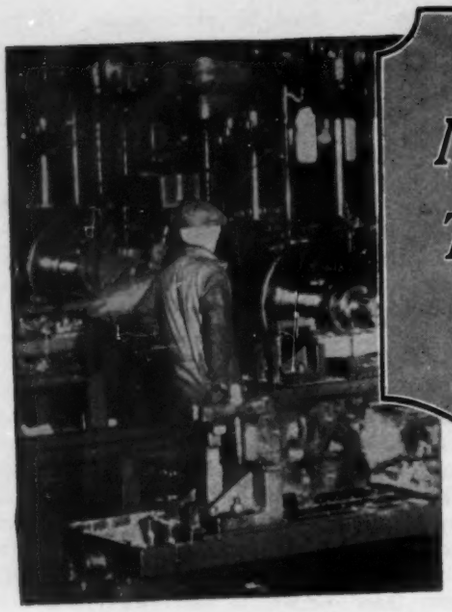
New Rotary-Type Plate Shear Reduces Usual Handling



Continuous shear for trimming the sides of plates

A NEW rotary plate shear of the continuous type, which leaves the stock flat with true square edges, has been developed by the United Engineering & Foundry Co., Pittsburgh, In addition to trimming the sides of the plates, the side trimmings are cut into short charging box lengths by two scrap shears into which they are guided automatically. The shears when used in conjunction with the proper end shearing equipment largely will eliminate the necessity for marking-out plates before shearing and a considerable amount of the handling that is common practice in the finishing end of plate mills.

The combination of a large bottom cutter and a smaller top cutter keeps the plates flat, with true square edges. The two shear units are mounted on shoe-plates. One unit is adjustable to give the proper distance between the cutters to suit the various widths of plates. An indicator is provided to show this distance. The adjustment, which is motor operated, can be made quickly to allow each successive plate, as fast as they come from the mill, to be sheared to a different width.



New Machine Tools and Shop Equipment

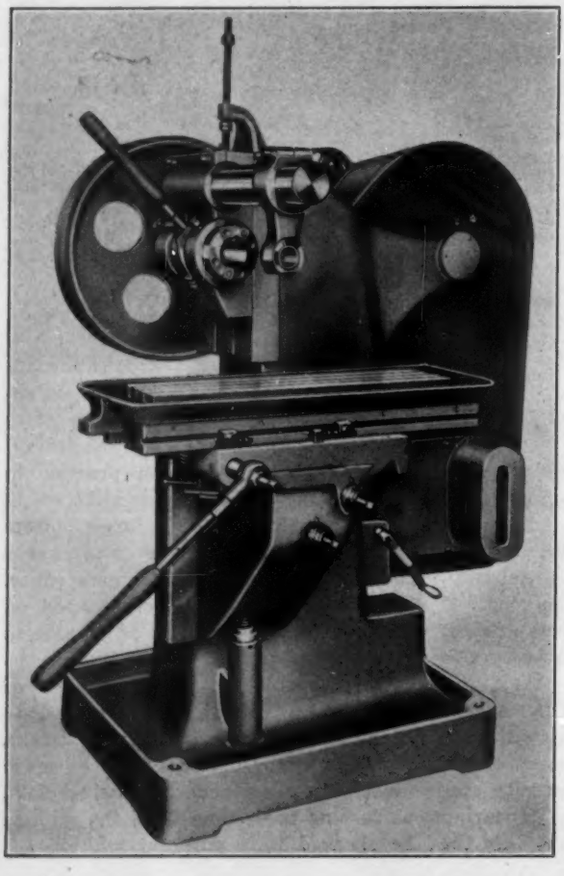
"There is always work and tools to work withal, for those who will."
—Lowell

New Belt Drive Provides Unusual Flexibility

No. 192

Kent-Owens Machine Co., Toledo, O., has designed a line of millers which are equipped with a new type of variable-speed drive the addition of which makes these millers suitable for both small lot and production work. The drive from the motor to the backshaft is through a combination flat and V belt. This belt rides upon its angular edges between two cone disks upon the motor shaft and upon its inside face over a plain pulley upon the backshaft. The cone disks upon the motor shaft are continually pressed toward each other by a coil spring, thus forcing the belt to its greatest diameter. To change speeds, the motor carrying the cone pulley upon its shaft is simply moved toward or away from the backshaft. As the motor approaches the backshaft and their center distance becomes less, the spring forces the V belt toward the outer circumference of the cone which operates the spindle at a high speed.

In the larger size No. 2 miller, shown in the accompanying illustration, there is an idler upon the spindle drive belt thus keeping this belt under the proper tension. The smaller No. 1 machine has been increased in range over the previous design and other changes have been made to improve convenience of operation and rigidity. The range of spindle speeds, 120 to 1200 revolutions per minute, is covered without steps, thus allowing the operator to select exactly the speed desired. In both machines the head can be fed vertically 6½ inches through the hand lever.



No. 192 — Variable-speed drive makes new millers suitable for both small lot and production work

Automatic Switch Follows Uniform Schedule

No. 193

General Electric Co., Schenectady, N. Y., is announcing a new automatic time switch for closing and opening electric circuits at short predetermined intervals and on a uniform schedule. It automatically energizes a circuit to control intermittent operation of electric equipment. The time cycle may be a few minutes or several hours, and is repeated continuously. Owing to the short time of a cycle the operation is without regard to the time of day, differing in this respect from earlier model switches which have 24-hour dials.

The time cycle depends upon the gearing used, and is fixed in each case by the manufacturer. In certain forms, however, the relative amount of time "on" during the complete time cycle can be varied by

the users. The contact-making device is driven by a synchronous motor. The device is housed in a sheet metal, dustproof case for indoor mounting, with knockouts and hinged front cover secured by a latch at the top, which may be sealed.

The switches are single-pole, with one-way or two-way contacts, and are rated 5 amperes at 115 volts or 2½ amperes at 230 volts. On circuits of higher amperage a magnetic switch may be employed in conjunction with the time switch.

Rod Magazine Provides Smooth Operation

No. 194

Brown & Sharpe Mfg. Co., Providence, R. I., has developed an automatic rod magazine which is adaptable to overhead and motor-driven screw machines in both regular and high-speed types. The new rod magazine, shown in the accompanying illustration, is similar in construction and operation to the other sizes previously announced by the company.

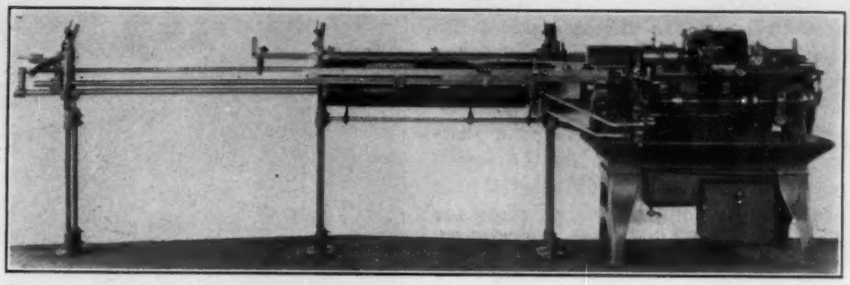
The mechanism of the rod magazine is connected with the feeding arrangement of the screw machine in such a manner that, when the end of the bar on which the machine is working passes a certain point, the machine, except the spindle, is automatically stopped, the mechanism of the rod magazine is engaged, and a new rod fed from the magazine into the spindle to the working position. The machine is then started automatically. Sufficient rods can be inserted in the magazine at any time to keep the machine operating for a long period, the exact time depending on the type of work being done.

Inclinable Punch Press Has Large Capacity

No. 195

Federal Press Co., Elkhart, Ind., has announced an addition to its line of open-back inclinable punch presses, the No. 7 model which is made in both the flywheel and geared types. The press, shown in the accompanying illustration, is of the geared type, having a capacity of 75 tons and a total weight of 14,000 pounds. It is equipped with roller bearings in the back gear bracket and has a bronze removable bushing in the flywheel. The crankshaft is 4¾ inches in diameter at the main bearing, and 5½ inches in diameter at the crank pin.

The press is lubricated by large oil pockets in the caps from which felt pads carry the oil to the shaft, giving constant lubrication as long as oil is in the pocket. Bolster area is 28 by 36 inches and 13½ inches die space is provided from bed to ram, stroke down, adjustment up. This particular press is arranged for direct motor drive with motor bracket mounted on the top of the machine and the motor driving directly into the balance wheel.



No. 194—Automatic operation features new rod magazine

Holders Built for Use With Alloy Tools

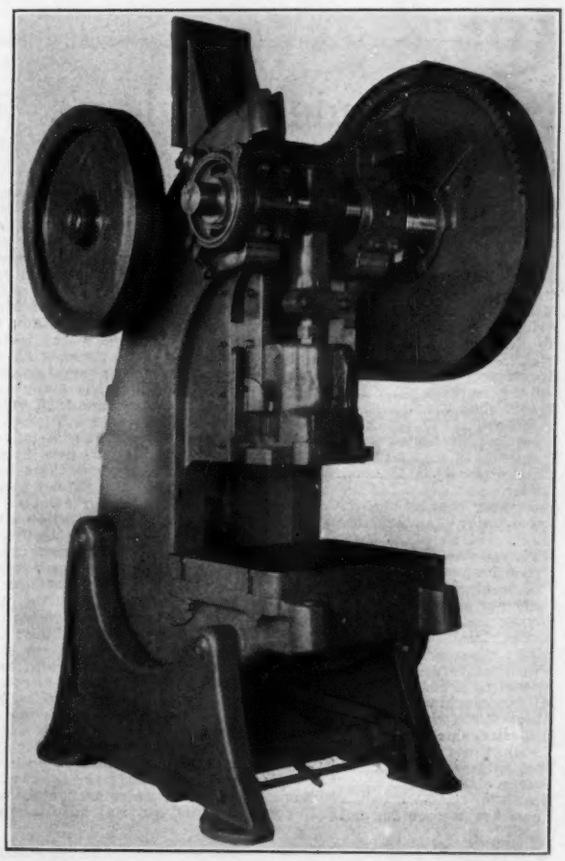
No. 196

Armstrong Bros. Tool Co., Chicago, is announcing a new line of holders which are designed for use with cemented tungsten carbide cutting tools. The holders will use high-speed steel bits tipped with less than an ounce of tungsten carbide. Because of the extreme brittleness of the tools, the new holders are made extremely rigid and are built out under the bit so as to give maximum support to the cutting edge. These new holders are designed for use on lathes, planers and shapers and hold the bit parallel to the shank. They are of two general types: Those broached for the standard square bits and those that take a deeper bit, one in which sufficient thickness has been added to compensate for the steel displaced by the tungsten carbide tip.

Safety Chucks Furnished in Many Sizes

No. 197

Titan Tool Co., Erie, Pa., has added several new designs to its line of safety drive chucks which now includes a size for tapping holes as small as 3/16-inch and a large size for tapping holes up to 1¼-inch. The differential nut principle for tension



No. 195—Open-back inclinable punch press is made in both the flywheel and geared types

adjustment of the chucks enables the operator to increase or decrease the driving tension to any point desired within the capacity of the tool.

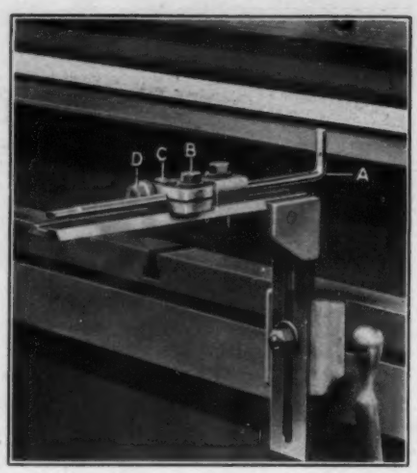
Round, knurled differential adjustment nuts are provided on the smaller sizes and hexagonal differential nuts are provided on the larger sizes for wrench tightening. Knurled lock nuts on the shank prevent plunging of the tool assembly and an additional lock nut for the differential adjusting nut prevents shifting of the adjustment after it has been set. The tension members consist of male and female steel cones designed for maximum driving surface. They are separated by a cone made of sheet fiber. The combination of the steel cones with fiber lining tied up with a differential adjusting nut provided with a positive lock of the set tension and still being easily accessible for change in adjustment, provides a satisfactory safety drive application.

Regulator Gives Precise Pressure Control

No. 198

Bastian-Blessing Co., Chicago, has designed a duplex two-stage regulator for welding and cutting which is intended to permit production on a practical commercial basis and assure precise and unvarying pressure control over wide pressure ranges. This controller has a special regulator for the first stage which is constructed to perform in perfect balance with a precision regulator at the second stage. Both stages are thus governed by regulators having large size diaphragms of proper material, functioning at any desired pressure. The result of proper proportioning and balancing of the action of these two regulators is the maintenance of a constant neutral flame, regardless of fluctuations in tank pressure.

Special shaped hexagonal adjusting screws are provided to permit unusually fine adjustment. The new regulator can be used with both welding and cutting torches at the same time, and it uses practically all of the gas in the cylinder, leaving none to be wasted. It is simple in construction, strong and unusually light. Forged parts are used throughout. An automatic safety outlet releases any abnormal or excess pressure caused by accident to the equipment.



No. 199—Press brake gage provides accuracy

Press Brake Gages Have Variety of Uses

No. 199

Cincinnati Shaper Co., Cincinnati, has designed gages for press brakes which are equipped with a micrometer adjustment. These gages, one of which is shown in the accompanying illustration, have full horizontal and vertical adjustment and may be used either on the front or rear of the press. Horizontal gage rod A can be moved quickly to the approximate gaging position and clamped in place with cap screw *B*. Final adjustment is then made with micrometer nut *C* and lock nut D.

These gages can be set for forming wide or narrow sheets either upward or downward. They can also be used as an adjustable two-step gage for making both bends of a channel successively with only one handling of the sheet. Gage rod *A* may be replaced with an ½-inch diameter rod. This can be notched for a step gage or bent to any desired shape for gaging a special bend.

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date described	Page
Bolt threader	All types of bolts and screws formed and threaded	Landis Machine Co.	161	June 5	83
Snagging machine	Large castings are ground easily; has many adjustments	Ransom Grinding Machine Co.	162	June 5	83
Limit switch	Will control many kinds of equipment; entirely automatic	Cutler-Hammer Inc.	163	June 5	84
Buffing lathe	Base cut down straight in front; has variable control	Bridgeport Safety Emery Wheel Co.	164	June 5	84
Press	Has increased slide adjustments; stresses are reduced	E. W. Bliss Co.	165	June 5	84
Screw machine	Accelerated boring provided; performs reaming operations	National Acme Co.	166	June 5	85
Crosshead planer	Many adjustments available; machines large work	Morton Mfg. Co.	167	June 5	85
Mill cut burrs	Variety of shapes and sizes made of high-carbon steel	Keller Mechanical Engineering Corp.	168	June 5	86
Friction chuck	For tapping and nut and stud setting; 3-inch capacity	Apex Machine Co.	169	June 5	86
Trolley	Built especially for foundry work; resists wear	Louden Machinery Co.	170	June 5	86
Welding rod	Designed for lighter sheets; makes all types of welds	Lincoln Electric Co.	171	June 5	86
Spectroscope	Requires no adjustments; operated by electricity	Adam Hilger Ltd.	172	June 12	71
Rotary machine	Three speeds are provided; has many applications	Peck, Stow & Wilcox Co.	173	June 12	71
Track shoe	Built for heavy-duty work; made of rolled section	Caterpillar Tractor Co.	174	June 12	71
Side head	Shaper attachment will machine locomotive driving boxes	Rockford Machine Tool Co.	175	June 12	72
Electric unit heater	Will heat any type of building; has alloy heating strips	American Foundry Equipment Co.	176	June 12	72
Shaper	Many improvements built into new crank-type machine	American Klopp Shaper Corp.	177	June 12	72
Toggle press	Nonrepeating clutch controls motion; has uniform speed	Zeh & Hahnemann Co.	178	June 12	73
Cutter	Victualic couplings grooved; thread form is omitted	Landis Machine Co.	179	June 12	73
Generator connections	Convenient connections permit changes in voltage	Columbia Electric Mfg. Co.	180	June 12	73
Press brake	Is of unusually large size; distortion eliminated	Cincinnati Shaper Co.	181	June 12	74
Safety switch	Conforms to underwriter's new test procedure	Westinghouse Electric & Mfg. Co.	182	June 12	74
Welding machine	Heavy-duty welder is of light weight; rapid work possible	Micro Products Co.	183	June 19	76
Press brake	Close adjustment is provided; constructed of steel	Long & Allstatter Co.	184	June 19	76
Pillow block	Fits all grades of commercial shafting; is antifriction	Link-Belt Co.	185	June 19	76
Conveyor controller	Automatically stops a conveyor in the event of breakage	Kurth & Knapp Mfg. Co.	186	June 19	76
Shaper	Special tool head is used; is of rigid construction	Morton Mfg. Co.	187	June 19	77
Buffing machine	Gooseneck design facilitates handling; control is simple	Hisey-Wolf Machine Co.	188	June 19	77
Screw threader	Provides wide speed range; machines many metals	Brown & Sharpe Mfg. Co.	189	June 19	78
Nitriding furnace	Is of bell-type construction; has uniform heating	Westinghouse Electric & Mfg. Co.	190	June 19	78
Motor	Special design for runout tables; is completely enclosed	Reliance Electric & Engineering Co.	191	June 19	78
Milling machine	Has new type of drive which provides flexibility	Kent-Owens Machine Co.	192	June 26	60
Automatic switch	Operates on uniform schedule; gearing sets time cycle	General Electric Co.	193	June 26	60
Rod magazine	Adaptable to all screw machines; is automatic	Brown & Sharpe Mfg. Co.	194	June 26	61
Punch press	Made in all types; has large capacity	Federal Press Co.	195	June 26	61
Tool holders	High-speed steel bits held firmly; built rigidly	Armstrong Bros. Tool Co.	196	June 26	61
Safety chucks	Many sizes can be tapped; are easily adjust	Titan Tool Co.	197	June 26	61
Regulator	Welding and cutting gases accurately controlled	Bastian-Blessing Co.	198	June 26	62
Press brake gage	Full horizontal and vertical adjustment is provided	Cincinnati Shaper Co.	199	June 26	62

Predicts Turn in Business Cycle During the Third Quarter

Opinions Expressed at Fifteenth International Convention of Purchasing Agents Point to Programs of More Liberal Buying

PROBABILITY of more liberal buying policies of commodities later this year, without marked departure from the hand-to-mouth basis of recent years, was voiced at the fifteenth international convention of the National Association of Purchasing Agents at the Stevens hotel, Chicago, June 16-19. Most commodity prices are approaching the valley or already have reached bottom, according to numerous views.

The annual exposition was held in connection, with about 125 firms as exhibitors. Toronto, Ont., was chosen as next year's convention city.

Forecasts of the business outlook, and discussions of the machine era featured addresses. Franklyn Hobbs, director of research, Central Trust Co. of Illinois, Chicago, in speaking on business of 1930, said:

Get Ready for Bigger Demand!

"Probably within a month, and surely during the coming quarter business activity will have passed the line established on the same date in 1929. We know what happened each month during 1929; we can, in reason, expect the business for a certain month not far ahead of us to match the business of that same month in 1929. And then, we should go on up during the closing weeks of the year, entering 1931 on practically the level at which we entered 1929. That's the business outlook as I see it.

"Get ready. Make sure that you do not collide with business which you are not prepared to handle when you reach that cross roads next month, or soon after. Be sure you have materials on hand, or on firm order, to enable you to carry on when the bigger demand for the product of your concern meets you at the cross roads."

Discussing "Better Business," Alvan T. Simonds, president, Simonds Saw & Steel Co., Fitchburg, Mass., declared that business is scheduled for an upturn in August, after the dullness in July, but that the movement may be slow until December. Decreasing money rates since last November indicate, with other factors, the beginning of another three-year cycle of advance in all lines, Mr. Simonds said, and a long cycle of advance over a 10-year period, with brief setbacks at the end of each three years. These swings, he described, as the normal orbits of business.

E. G. Howell, director of research, Institute of Scrap Iron and Steel, and member of the firm of Erman-Howell & Co., Chicago, strongly urged that steel scrap containing alloys be segregated at the source of production and kept separate, in discussing "Alloy Steel from a Scrap Standpoint," before the iron and steel committee.

Benjamin Schwartz, director general, Institute of Scrap Iron and Steel, New York, addressed a dinner session of the iron and steel committee on the general aims of the scrap institute.

E. C. Smith, assistant district manager, Republic Steel Corp., Massillon, O., in speaking on "Alloy Steels," questioned whether stainless steel is not more valuable as a heat-resisting material than it ever will be as a substitute for silver or nickel. It is not rash to predict, he declared, that within a generation some of the chrome-iron alloys will be used in all places where flame strikes directly upon metals.

At a meeting of the transportation group, G. H. Clamer, president and general manager, Ajax Metal Co., Philadelphia, talked on "Development and Future of the Nonferrous Ingot Industry." Inasmuch as the ingot industry is built up on economic advantages to consumers its success is assured, and doubts as to the future, based on the possibility of foundries adopting practices of ingot producers in the direct use of nonferrous scrap, are not well founded, according to Mr. Clamer.

Object to Sales Agreement

Objection was voiced at a meeting of the iron and steel committee to the standard sales agreement of the iron and steel foundry groups, an analysis of which was presented by F. M. Roos, Consolidated Car Heating Co., Albany, N. Y. It was voted that members of the committee confer with the foundry groups without general endorsement of the foundry proposals, and that more flexibility be urged in the sales agreements to meet buyers' needs.

Speaking on "The Color Marking of Steel Bars," A. J. Copeland, assistant manager, Industrial Brownhoist Corp., Bay City, Mich., declared that adoption of the color code for tool steel markings should be up to the buyers. The iron and steel committee approved a motion to outline color markings for application to leading tool steels, but to relieve the committee from further study of the feasibility of a more complete color code.

Secretary of Commerce Robert T.

Officers Elected

President
JOSEPH E. MILLS
City commissioner of purchases, Detroit

Vice President at Large
JOHN R. WHITEHEAD
Purchasing agent Fairbanks, Morse & Co., Chicago

Vice Presidents
WILLIAM H. JACKSON
Axelson Aircraft Engine Co., Los Angeles
G. A. TOMPSON
The Empire Co.'s., Bartlesville, Okla.
WILLIAM GROSSMAN
A. Leschen & Sons Rope Co., St. Louis
HARRY C. BRADFORD
Rex Paper Co., Kalamazoo, Mich.
D. M. D'ALBENAS
Northern Electric Co., Montreal
F. H. MACKNIGHT
Westinghouse Electric & Mfg. Co., Wilmerding, Pa.
J. E. SHELTON
City purchaser, Birmingham, Ala.
E. H. HAWKINS
E. I. du Pont de Nemours & Co., New York
L. P. MARSHALL
Standard Electric Time Co., Springfield, Mass.

Chairman
(Iron and Steel division)
W. W. MACMILLEN
National Malleable & Steel Castings Co., Cleveland

Lamont sent a statement to the convention in which he said wastes in production had been cut sharply through united action of purchasing agents and suppliers and results to be achieved mean reduction of waste in distribution.

Much attention was given to aviation as a part of the transportation group. Establishment of a national clearing house for reports of findings of scientific and engineering groups in the aviation industry, and foundation of a central informaton bureau for data regarding purchasing and supplies, were advocated by several speakers.

Ohio Foundry Group in Sectional Meeting

Refractories, foundry costs and the revised industrial foundry code for the state of Ohio engaged the attention of the members of the Ohio Foundries association attending the third sectional conference of the association at the Congress Lake club near Canton, O., June 18. These sectional conferences are arranged to bring together the members of various districts for discussion of local problems. Tentative plans for subdividing the membership into four groups, namely, gray iron, malleable iron, steel and nonferrous, was announced by secretary Robert Hoierman.

A more active interest in the revised code of the industrial commission as applied to foundries and more careful selection of men through whose hands the code must pass to become law, was urged by J. W. Beale, Ohio Steel Foundry Co., Lima, O. Referring to accident statistics covering several years, he claimed that in practically all instances the evidence showed partial or complete contributory neglect by the injured party or his associates. In recent years, according to Mr. Beale, failure on the part of machinery or equipment practically has ceased to be a factor as a cause of accidents.

A. C. Denison, president, Fulton Foundry & Machine Co., Cleveland, presented a paper illustrating the fallacy of depending solely on a cost system. Intelligent modification and application of any cost system is necessary to meet special and changing conditions. Different methods of figuring costs will show startling discrepancies in extreme cases. This and several related features were taken up again at the round table discussion which followed the formal meeting. Refractories for foundry use, particularly in the cupola, were discussed in a paper by D. A. Williston, Lacledé-Christy Clay Products, Co., St. Louis.

12-Ton Drop Hammer Is Shipped to Italy

Some idea of the immense size of the drop hammer shown in the accompanying illustration may be gained by comparing its height with that of the man standing beside it. The hammer is a 24,000-pound steam drop hammer built for the Fiat Co. of Italy by the Chambersburg Engineering Co., Chambersburg, Pa., for installation at the Milano works of the Italian company. The hammer has a cylinder bore of 32 inches and a stroke of 52 inches. The steam line is 7 inches in diameter and the exhaust 9 inches. The ram measures 66 inches from front to back; distance between the guides is 42 inches.

12-ton drop hammer completely assembled

Because of the length of the work for which it is intended the guides are extra wide and are of a standard board drop hammer type. The cylinder is lined, all valves are bushed and all connections are fitted with roller bearings. Overall height of the hammer from the bottom of its three-piece anvil to the top of the head is 34 feet 10 inches. From the floor line it is 24 feet 4½ inches. The anvil is made in three sections to facilitate shipping and has a total weight of 482,000 pounds of which the upper section accounts for 222,000 pounds. Total weight of the complete hammer is 662,000 pounds.

Lays Cornerstone for an Engineering Building

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently laid the cornerstone for its new $2,000,000 engineering laboratory. As Vice President W. S. Rugg slowly lifted from the speaker's stand a small model of the cornerstone and carefully placed it on a model building, the big stone swung through the air without the aid of human touch and automatically descended into the place provided for it.

The motivating force behind the performance was a complicated interlocked system of switches, motors, relays, controls and tubes, whose basis was the photoelectric cell. Tiny beams of light from concealed sources played across the speaker's stand and were focused on photoelectric cells hidden in supporting pillars. As the model stone moved it interrupted these light rays, affecting the sensitive cell and establishing successive electrical circuits which in turn controlled corresponding stages of movement of the crane and large suspended stone.

The 11-story building is to provide housing for the main engineering operations of the company. Five stories and a basement will be devoted to laboratories, while the upper six stories will house offices for the engineering staff. Altogether, it combines laboratories, work shops and offices, bringing into close relation those engaged in the engineering studies and developments, enabling the departments to maintain mutually helpful contacts.

Hold Dinner Meeting

Charles Schoen, works manager, Kearney & Trecker Corp., Milwaukee, addressed the members of the Engineers Society of Milwaukee at the monthly dinner meeting June 18 on "Why Trade Apprenticeship Concerns the Engineer." Another speaker on the program was Harold S. Falk, vice president, Falk Corp., who spoke on "Interesting Aspects of the Local Movement for Apprenticeship Training." There was a display of work done in apprentices in Milwaukee industries.

The first shaft crane made in the United States was designed by S. T. Wellman and built by T. R. Morgan Sr. at Alliance, O.

Editorials

A Moratorium on Sales Effort?

AFTER increasing his production steadily since December, Henry Ford apparently has reached the point where only by forcing cars and trucks on dealers can he maintain a daily rate of 9000 units or thereabouts. Accordingly, he is curtailing his operations moderately this month, will come down to July 1 with his banks of parts depleted and his inventories nil, and will shut down for two weeks in July.

At least, so the rumor goes at Detroit, and with it is the logical inference that other important factors in the automotive industry may close for a fortnight, to afford all employes a simultaneous vacation, expedite plant repairs and enable the retail markets to catch up. Whether or not the program is adopted, it contains the germ of an idea.

No amount of camouflage or artificial optimism can becloud the fact that the outlook for business this summer is not particularly bright. What the fall will bring forth is too distant for concern at this time. While it is true that vigorous selling tactics are generally preferable to lethargy, nevertheless there are times when aggressiveness is self-defeating.

At Detroit, and in practically all important steel consuming centers, it does not seem probable that the most astute sales campaign could conjure up any notable increase in demand for iron and steel over the next sixty days. When consumers have no brisk call for their finished products there is no point to their accumulating raw material. For salesman after salesman to harass buyers with no orders to place is to invite the inescapable sequel—easier prices—with no compensating volume at this time and an injured price structure when buying is resumed.

It is almost heresy, in view of the go-getting policy of recent years, to say that a moratorium on sales effort would benefit the iron and steel industry at this time, but there is a good deal of opinion that a brief vacation would do it good.

Will Consume More Steel Products

BROAD possibilities lie ahead in expanding the uses of flat rolled steel, it was revealed forcefully last week at the annual meeting of executives and fabricators in that industry. According to a survey made by the trade research division of the National Association of Flat Rolled Steel Manufacturers, a possible total of 161,113,340 tons exists in ten major fields alone. Considered on an annual basis, it is believed that these ten fields could consume steel to the extent of 8,179,465 tons a year. This same group now is accounting for 2,531,545 tons a year.

Of course, it can be regarded as certain that the goal will not be attained, nevertheless it affords a more comprehensive picture of the possibilities than has been afforded up to this time. Production of flat rolled products in 1929 was approximately 8,350,000 tons; in 1928 it was 7,680,000 tons. The ten individual markets considered in the survey therefore now consume somewhat less than one-third of the annual production of the flat rolled steel. From the progress which has been made in recent years in creating a wider acceptance of steel products, it seems apparent that tremendous and almost unbelievable increases in tonnage can be attained through well-directed trade promotion. Manufacturers and fabricators alike now appreciate the possibilities and are cooperating in extending the use of steel.

Tractor Industry Going Strong

WORD from the tractor industry that it has enjoyed one of the best first quarters in its history is not surprising in view of previous reports earlier this year of the good demand for pig iron and finished steel from builders of tractors, agricultural implements and road machinery. Preliminary estimates of second quarter tractor production indicate a satisfactory record, at a time when the automotive industry and other lines suffered a sharp slump.

The tractor industry heretofore has been submerged as a branch of the agricultural implement industry, but the value of the 221,000 units built in 1929 was nearly a third of the total of all implements. The estimated value of 1929 implement production is $650,000,000, of which tractors represent $193,000,000. With such a record tractor manufacture is a large industry itself. This new industry has been built up in the past 20 years.

Why tractors should be generally grouped in trade reports with farm implements is not clear, considering the large numbers which are being

used in general construction purposes. The 6,500,000 farms unequipped with tractors offer the best market, though by no means all of the potential outlet in the United States. A third of the units made in 1929 were exported, another fertile field for future business.

About 22,000,000 automobiles are in use in the United States. When in comparison with this it is considered 1,000,000 tractors are in use, the tractor industry is not doing so bad.

Rails' Efficiency Cuts Their Buying

FOR a large proportion of the short-range buying of the past few years, with its consequent reduction in inventories and release of capital, the railroads have been responsible. Their campaign to load cars more heavily and to move them more expeditiously has aided industry greatly.

It is logical that the railroads themselves should be affected by this improvement in procedure. They, too, have been enabled to reduce their inventories and they have gradually bettered their methods of purchase, storage and utilization. But it also has followed that the railroads have been enabled to reduce their total expenditures.

For fuel, materials and all manner of supplies, the class 1 railroads of the country in 1929, according to the bureau of railway economics, Washington, expended $1,330,000,000. This was an increase over the $1,270,000,000 of 1928, but a reduction from the $1,400,000,000 of 1927 and the $1,560,000,000 of 1926, this being a record.

Excepting 1928, the railroads' outlay for materials and supplies in 1929 thus was the least of any of the preceding seven years, yet the railroads in 1929 moved the greatest volume of freight in their history. On some of the industries supplying the railroads the incidence of a smaller volume of purchases is noteworthy, but on the whole the increased efficiency of the carriers is of superior consequence to the country.

No Regrets at Hoch-Smith Passing

THE burden of editorial comment concerning the Supreme Court's decision on the Hoch-Smith resolution, wherein the resolution was "tainted with constitutional doubt," as one editor expressed it, has been sympathetic with the court.

There is a widespread feeling that henceforth the interstate commerce commission will proceed to regulate freight rates from the standpoint of the merit of each particular case, and there will be no more effort to adjust rates on other commodities in order to give the benefit to agriculture.

From the standpoint of the iron and steel industry as a whole, there does not appear to have been any subsidizing of agriculture at the expense of the industry. The new mileage freight rates, effective May 20, are a Hoch-Smith sequel.

It is true that short-haul rates have been sharply increased, to an extent which in many cases patently seems unfair and which a judicial review may well ameliorate. On the whole, however, it is estimated that consumers of iron and steel in so-called eastern territory will pay the railroads $2,500,000 less per year in freight bills.

Regardless of this, however, it seems eminently fair that freight rates be viewed strictly on their individual, immediate merits, and not from the standpoint of attempting to help an industry.

Trade and Transportation Lead

POPULATION figures obtained in this year's census are causing dismay or jubilation in many rival cities, though some of the most significant features are yet to be disclosed. These have nothing to do with the question of whether Podunk has outstripped Squeedunk, or if the center of population has shifted one mile farther west, but with such matters as employment and trends in occupations. An estimate for 1929 made by Dr. E. Dana Durand, statistical assistant to the secretary of commerce, and correlated with prior census figures by the national industrial conference board foreshadows what the 1930 census may establish as a fact.

The impressive point of the figures is the gain in the number of persons engaged in trade and transportation service; from 25 per cent of the total employed in 1920 to 30 per cent in 1929. Practically no gains are registered in professional, domestic and personal service, and a slight loss in those engaged in mining. Agriculture continued to lose in the past decade, dropping from 26.7 per cent of the total to 22.8 per cent. The proportion of those engaged in manufacturing and mechanical lines after mounting steadily over a period of 90 years turned down slightly.

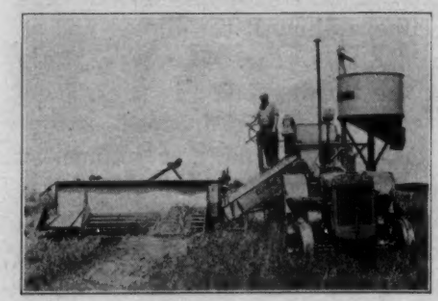
Over a period of a century agriculture moved from 72.2 per cent down to 22.8 per cent. Trade and transportation moved up from 2.5 per cent to 29.9 per cent, and manufacturing and mechanical lines increased from 12 to 28.5 per cent.

With the productive capacity of those engaged in mechanical pursuits greatly enhanced by mechanized facilities the trend over the past two decades indicates there will not be much change in the near future in personnel. But the trend indicates further expansion in the growing field of trade and transportation. Agriculture is nearing the irreducible minimum if any semblance of the nation's self-dependence is to be maintained.

IRON TRADE REVIEW

Volume 86, Number 26 — Published Every Thursday

E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*



Agriculture Presents Growing Market for Steel. Page 43.

Fights Unemployment with Two Weapons

UNEMPLOYMENT insurance, something often discussed but seldom put in effect, is to be tried by the General Electric Co. The company proposes to create a fund, contributing half, with the employes contributing the other half, employes to receive a substantial part of their regular wages when unemployed. The company also is to enforce a set of rules intended to prevent unemployment. Of course, no one company with the best rules can guard against unemployment if others do not take adequate precautions, such is the relationship between all industries. The General Electric plan is outlined on pages 58 *and* 59.

A potential steel market of more than 161,000,000 *tons in ten major consuming lines is reported by the National Association of Flat Rolled Steel Manufacturers. The time or periods in which this demand may fall varies with the industries. An analysis of the markets is presented on pages* 43-46.

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IRON TRADE REVIEW is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers Inc. and National Publishers Association. Branch offices: 1347 Peoples Gas Bldg., Chicago; 505 Bell Block, Cincinnati; 2203-2206 No. 220 Broadway, New York; 507-8 Oliver Bldg., Pittsburgh; 1708-11 Claus Spreckels Bldg., San Francisco; 1653 Pennsylvania avenue, Washington; and Boston. Foreign offices: Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Dahlmerstrasse 64A Berlin Lichterfeld-West, Germany; cable address: *PENTON*, Cleveland; *IROTRAPEN*, London. Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries £2:0:0 per year. *Entered at the Post Office at Cleveland as Second Class Matter.*

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The Business Trend

Uncertainty Still Clouds Business Horizon

VIEWED from broad perspective or analyzed individually the statistics which reflect the trend of business yield little of encouragement for the early summer months. Optimists are satisfied to call the present situation a seasonal dullness, and in a degree they are supported by fact. However, many astute observers believe that there is more behind the curtailed activity than can be attributed to seasonal influence. It is hinted that national uncertainty, politics, conditions abroad and other factors are contributing jointly to depress American business below the level that should prevail in a normal summer.

THE current stock market activity must be construed as an indication of uncertainty on the part of financial leaders. Discounting the purely political aspects of their attitude—if such exist in fact—there still remains the impression that Wall Street is seriously disturbed over the business outlook.

AN OPINION, emanating from a source that gives it the weight of seasoned authority on matters pertaining to the steel industry, is that prices have neared the bottom and that marked improvement within 60 days is to be expected.

WITH few exceptions, commodity prices continue to decline, although the dip is not as pronounced as earlier this year. However, there are no signs that the turning point is near. IRON TRADE REVIEW'S composite has dropped gradually during the last month and now stands at $33.52 as compared with $33.73 in May. After some slight recovery in copper prices, they have broken again and one smelter is offering metal at 11.25c, the lowest since 1914. The price varies from this figure up to 12.00c.

THE rate of steel operations has dropped to 68 per cent. This is the lowest rate since late in January. Automobile output, which declined in May, following increases for five consecutive months, is responsible in a measure for the reduced activity in steel. Further curtailment at Detroit is in sight for July.

ON THE other hand, orders for structural steel increased from 59 per cent of capacity in April to 75 per cent in May. The average rate of shipments of fabricated structural steel during the first five months of 1930 was 70 per cent of capacity compared with 73 per cent during the corresponding period last year.

The Barometer of Business

INDUSTRIAL INDICATORS

	May	One month ago	One year ago	Average 1913
Pig iron output (Daily average, tons)	104,509	106,418	122,106	83,900
Machine tool orders	165.1	176.8	329.5	.....
Unfilled orders (tons)	4,059,227	4,354,220	4,304,167	4,513,000
Ingot output (Daily average, tons)	149,066	159,358	195,302	.....
Dodge Bldg., awards in 37 states (sq. ft.)	53,732,000	56,620,000	80,656,000	.....
Automobile output	441,826	467,092	636,250	.....
Coal output, tons	35,884,000	35,750,000	40,090,000	39,869,000
Business failures; number	2,179	2,198	1,897	1,336
Business failures; liabilities	$55,541,462	$49,059,308	$41,215,865	$22,732,000
Cement production, Bbls.	17,271,000	13,521,000	16,151,000	7,704,000
Cotton consumption, bales	473,917	532,382	668,229	438,218
Car loadings (weekly average)	919,711	904,823	1,051,000	.....

FOREIGN TRADE

	May, 1930	One Month ago	One year ago	Average 1913
Exports	$322,000,000	$334,000,000	$385,013,000	$194,000,000
Imports	$285,000,000	$308,000,000	$400,149,000	$149,900,000
Gold exports	$82,000	$107,000	$467,000	$5,234,000
Gold imports	$23,550,000	$65,539,000	$24,098,000	$5,900,000

FOREIGN EXCHANGE

	Normal	June 23, 1930	One month ago	One year ago
Sterling	$4.86	$4.86	$4.86	$4.85
Francs	19.3c	3.92c	3.92c	3.91c
Lira	5.26c	5.24c	5.24c	5.24c
Marks	23.8c	23.86c	23.87c	23.76c

FINANCIAL INDICATORS

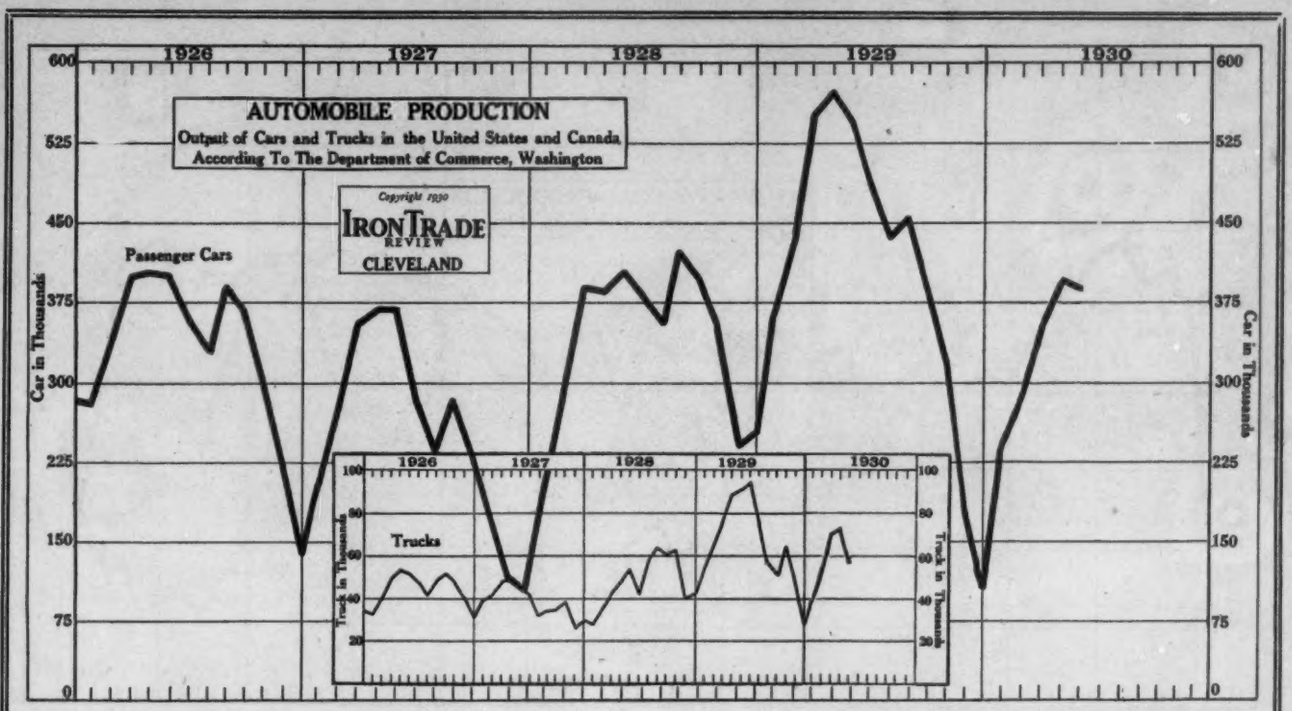
	May	One month ago	One year ago	1913
25 Industrial stocks	266.36*	331.64	365.94	$58.19
25 Rail stocks	110.94*	125.36	132.65	$82.90
40 bonds	86.79*	88.08	86.86	$93.00
Bank clearings (000 omitted)	48,852,169	51,005,367	54,416,439	$13,895,000
Commercial paper rate N. Y., per cent	3½-4	3¾-4	6	5.60
**Commercial loans (000 omitted)	8,402,000	8,593,000	9,155,000	.....
Federal Reserve ratio, per cent	83.2	83.6	74.7	.....
Railroad earnings	†62,271,504	61,074,229	94,204,113	$59,301,000
Stock sales, N. Y. stock exchange	78,040,080	111,041,000	82,600,470	6,924,000
Bond sales, par value	221,488,200	267,597,400	215,668,900	$41,499,000

*June 18. **Leading member banks Federal Reserve System. †April.

COMMODITY PRICES

	May, 1930	One month ago	One year ago	Monthly Average 1913
IRON TRADE REVIEW composite average of 14 iron and steel prices	$34.23	$34.44	$37.10	$26.32
Bradstreet's index	$10.7741	$10.939	.....	100
Wheat, cash (bushel)	$1.04	$1.29	$1.05	$0.92
Corn, cash (bushel)	$0.79	$0.98	$0.88	$0.51
Petroleum, crude (Bbl.)	$1.18	$1.52	$1.11	$2.50

The Business Trend

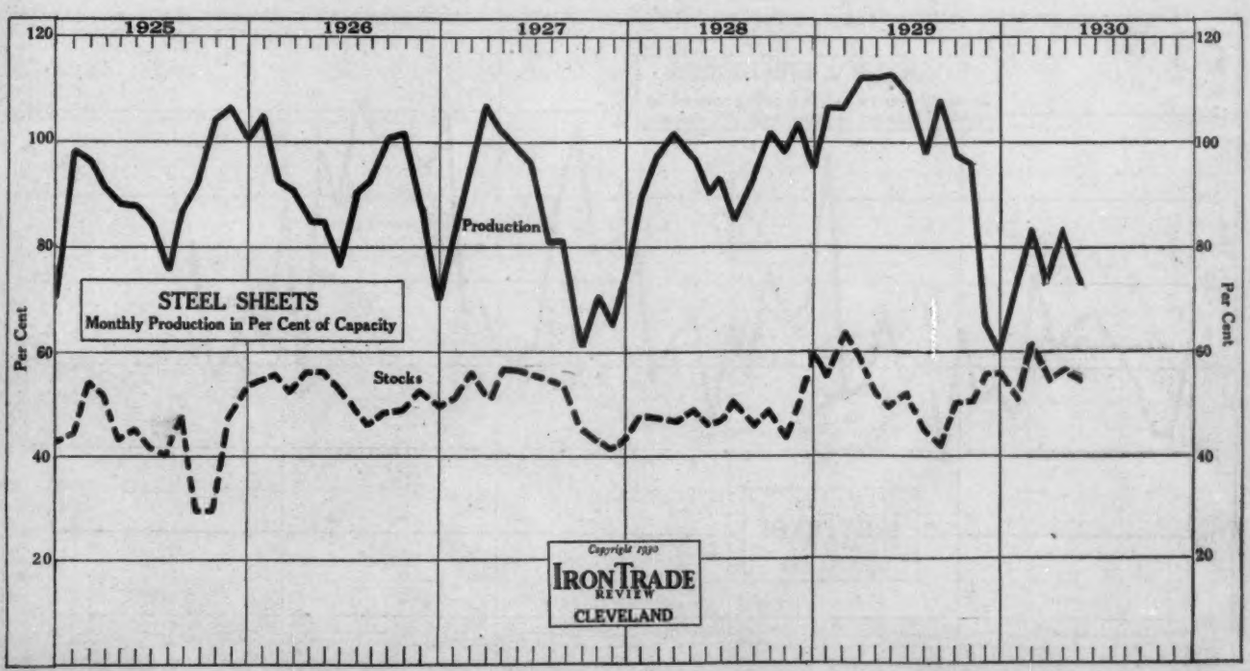


Automobile Production

AFTER rising steadily for five months, automobile production in the United States and Canada in May turned downward. Passenger car output for May totaled 383,521 cars as compared with that of 395,582 cars for April. Truck production in May was 57,791 units contrasted with the 70,945 units of April. Decreased truck production in May is approximately 19 per cent below April's level but that of passenger cars is only about 3 per cent lower. On the other hand, truck production is above 1928 levels.

Independent Sheet Output

MAY output of sheets in the plants of independent sheet steel producers amounted to 73.3 per cent of capacity, according to the figures prepared by the National Association of Flat-Rolled Steel Manufacturers. This represents a drop from 84.0 per cent in April and is even lower than the March percentage of 73.7. Stocks decreased slightly from 56.6 per cent of capacity in April to 54.7 per cent in May. The sheet situation reflects the automobile building dullness.



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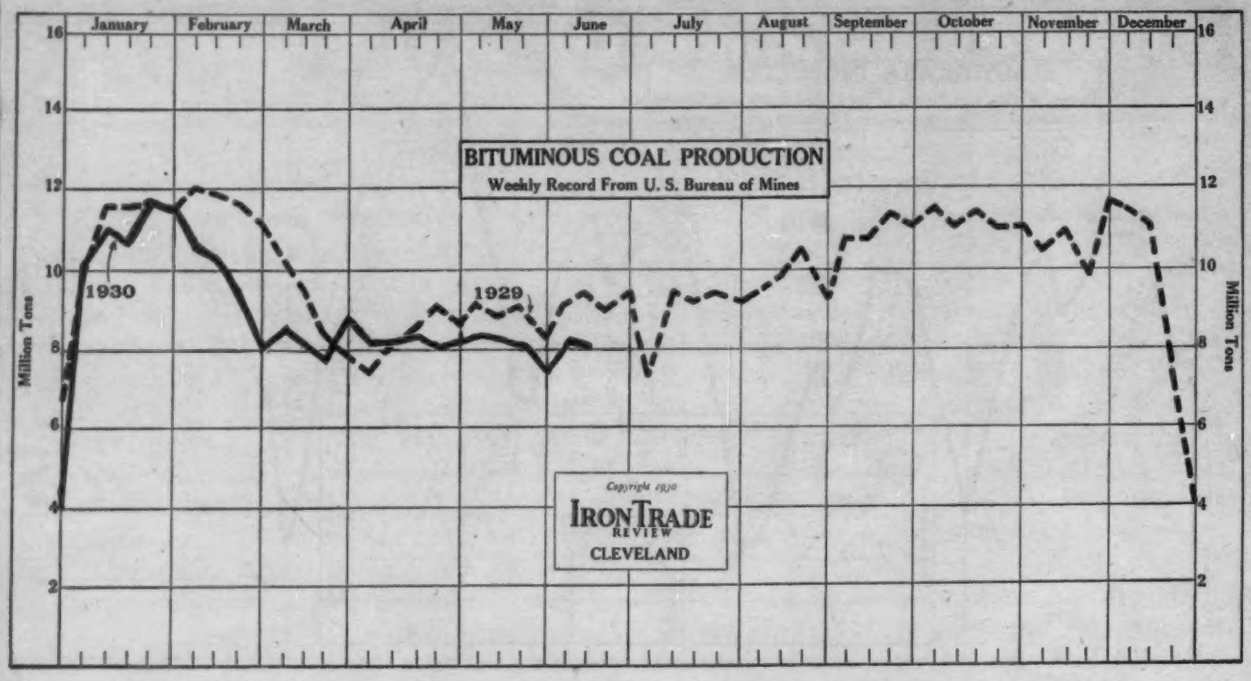
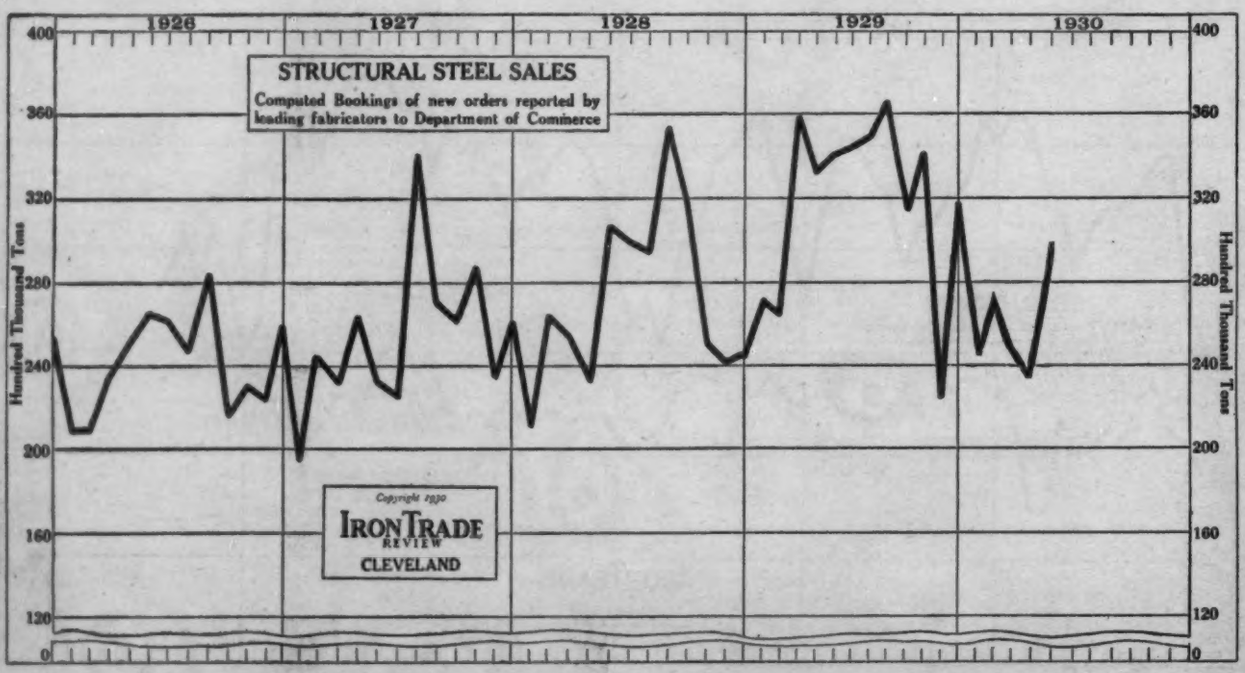


Structural Steel Sales

STRUCTURAL steel orders, as reported by principal manufacturers to the department of commerce, in May rose sharply to a level that has not been reached for six months. Orders for May totaled 300,000 tons as contrasted to 236,000 tons in April. Present operations are at the rate of about 75 per cent capacity, whereas April activity was equivalent to only 59 per cent. This change has been due largely to orders coming from building activity in the vicinity of New York city.

Soft Coal Production

PRODUCTION of bituminous coal still continues its downward trend due to reduced industrial activity. The sudden drop in production in the latter part of the month was largely due to the holiday that came in the last week. For the week ending June 14 the bureau of mines estimates that the output was 8,016,000 tons against 9,151,000 tons for the week of June 7 and 9,431,000 for the corresponding week of last year. To June 14, 1930, production is about 14 per cent below 1929 levels.



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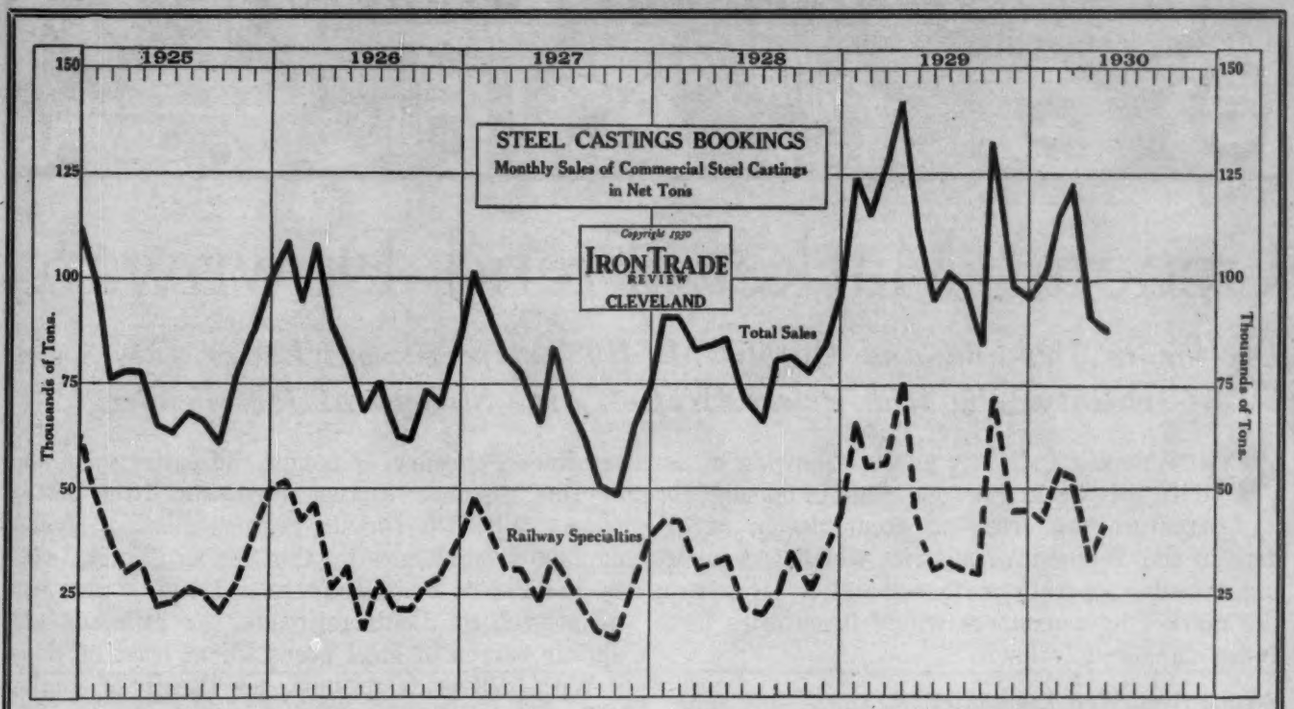
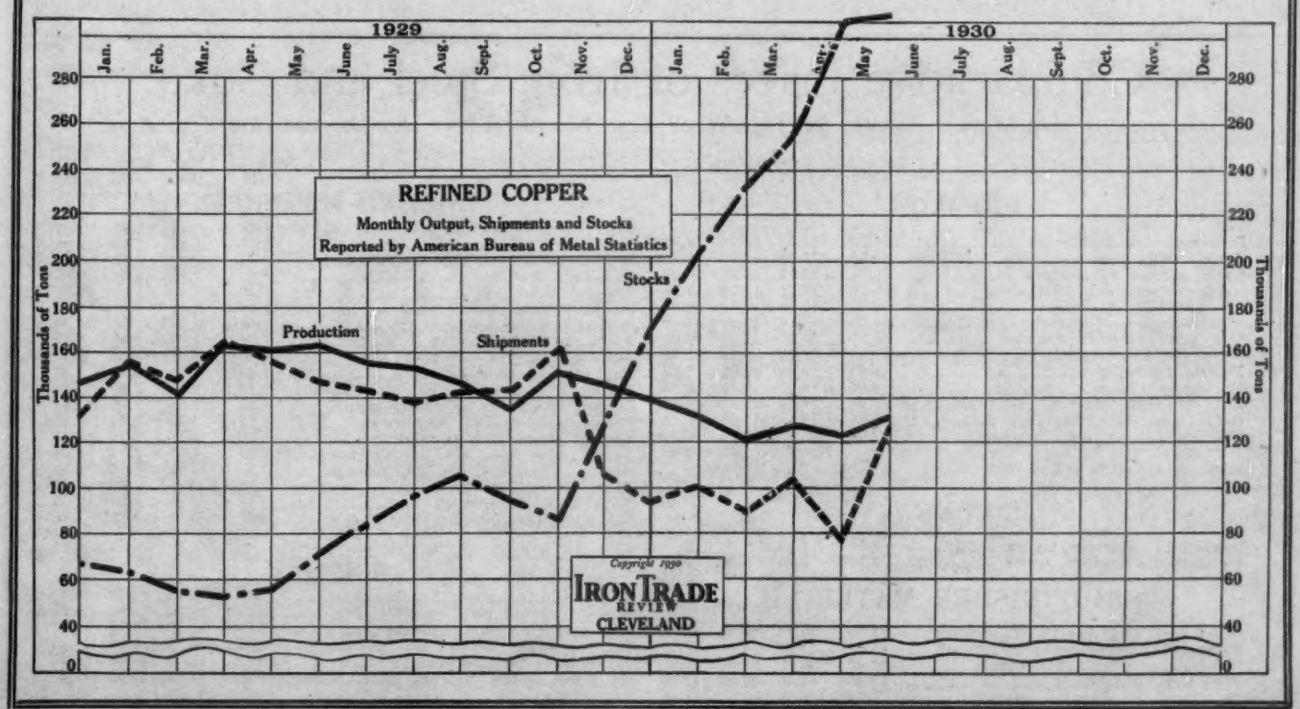


Steel Casting Bookings

ORDERS for steel castings in May, as reported to the department of commerce by the principal manufacturers, totaled 89,687 tons compared with 92,966 tons in April and 113,329 tons in May, 1929. May orders for railway specialties increased to 41,252 tons from 35,213 tons in April, but still are under the 44,919 tons of May, 1929. Total orders for May were equivalent to 62 per cent capacity contrasted with the 64 per cent level for April and 78 per cent in May, 1929.

Refined Copper

DURING May total refined copper stocks in producers' hands in North America continued to rise to new high records, amounting to 308,646 tons as compared to 301,338 tons in April. Although the tonnage of copper stocks increased, the rate of increase seems to be tapering off. May production of 132,183 tons is an increase over April's production of 124,531 tons. Probably due to the lowering of copper prices, shipments during the month of May increased to 124,875 tons.



General Market Trend Downward

Decline in Demand and Output Mildly Tempered, but Lower July Seems Certainty—Pig Iron Prices Drop—Large Structural Jobs Pending

STEEL makes a slightly greater showing of activity this week, due to a bulge in demand for structural material, an accumulation of orders in the Youngstown district which is tempering receding operations there, and a foray into the market by consumers whose inventories have fallen dangerously low.

Steel Prices Well Liquidated

This improvement, however, is a temporary upswing, such as frequently occurs to decelerate a declining market, and is not a trend. It is generally conceded that steel approaches the close of the second quarter with the price situation well liquidated, but not the overproduction of 1929.

Of the four major outlets for steel, pipe production is practically covered for the remainder of the year, and structural steel jogs along at about 80 per cent of last year's record gait. But requirements of the automotive industry and of the railroads will go lower before they go higher, and they tip the scales downward.

Automotive production in July will be the lowest since February, if not of the entire year, and at this distance August forecasts little betterment. With the further postponement of awards of 2300 freight cars by the Illinois Central, 1500 by the Pacific Fruit Express and 500 by the Minneapolis & St. Louis railroads, the railroads also appear barren of steel needs for at least 60 days.

With deliveries prompt, no threat of higher prices and the carryover of second quarter contracts fairly heavy, steel users are oblivious to the approaching turn of the quarter. Considering the few days remaining, the interest of pig iron consumers in their third quarter needs also is surprisingly mild. In several districts melters who had issued third quarter inquiries have placed only part of the tonnage specified.

Steel Operations Continue To Decline

As a consequence of this short-range buying, steelmaking operations have been further curtailed. Pittsburgh mills, long at 70 per cent, are now down to 65. Cleveland mills are off 9 points, to 41 per cent. Buffalo producers aver-

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	June 25, 1930	May 1930	March 1930	June 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	20.76
Basic, valley	18.50	18.50	18.50	18.50
Basic, eastern del. eastern Pa.	18.76	18.75	18.80	20.25
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.76
No. 2 foundry, Chicago	18.00	19.00	19.50	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.40
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Philadelphia	20.26	20.26	20.76	22.76
Malleable, valley	19.00	19.00	19.00	19.00
Malleable, Chicago	18.00	19.00	19.50	20.00
Lake Superior, charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	19.13	19.13	19.13	19.13
Ferromanganese, del. Pittsburgh	108.79	108.79	108.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12.00 to $13.00, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.55	2.60	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	$31.00	$32.20	$33.00	$35.75
Sheet bars, open-hearth, Pittsburgh	31.00	32.20	33.00	35.75
Billets, open-hearth, Pittsburgh	31.00	32.20	33.00	35.75
Wire rods, Pittsburgh	36.00	36.40	38.00	42.00

	June 25, 1930	May 1930	March 1930	June 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.75	1.75	1.85	1.95
Steel bars, Chicago	1.85	1.85	1.90	2.05
Steel bars, Philadelphia	2.04	2.04	2.12	2.27
Iron bars, Chicago	1.90	1.90	1.95	2.05
Shapes, Pittsburgh	1.70	1.75	1.80	1.95
Shapes, Philadelphia	1.76½	1.77	1.81	2.06
Shapes, Chicago	1.80	1.85	1.90	2.05
Tank plates, Pittsburgh	1.70	1.75	1.85	1.95
Tank plates, Philadelphia	1.90½	1.91	2.00	2.15
Tank plates, Chicago	1.80	1.85	1.90	2.05
Sheets, blue anl., No. 13, Pittsburgh	2.15	2.15	2.25	2.35
Sheets, black, No. 24, Pittsburgh	2.55	2.55	2.65	2.95
Sheets, gal., No. 24, Pittsburgh	3.15	3.25	3.30	3.65
Sheets, black, No. 24, Chicago	2.70	2.70	2.80	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.35	2.50	2.50
Sheets, galvanized, No. 24, Chicago	3.35	3.35	3.45	3.85
Plain wire, Pittsburgh	2.30	2.35	2.40	2.50
Wire nails, Pittsburgh	2.15	2.15	2.30	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pittsburgh	15.00	15.40	16.60	18.30
Heavy melting steel, eastern Pa.	13.25	13.38	14.95	16.25
Heavy melting steel, Chicago	12.00	12.55	13.20	14.95
No. 1 wrought, eastern Pa.	15.25	15.38	15.25	16.25
No. 1 wrought, Chicago	11.25	12.70	13.50	15.40
Rails for rolling, Chicago	14.50	14.90	15.00	17.50

Current Prices for Rolled Steel Products

STEEL PLATES

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.98c to 2.03c
Boston, del.	2.10c to 2.15c
Chicago, base	1.80c
Cleveland, delivered	1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.85c to 1.90c
Coatesville, Pa., base	1.80c
Pacific Coast, c.i.f.	2.25c
St. Louis, del.	2.12c
Detroit, del.	1.96½c

STRUCTURAL SHAPES

Pittsburgh, base	1.70c
Philadelphia, del.	1.76½c
New York, del.	1.90½c to 2.10½c
Boston, del.	2.03½c to 2.13½c
Chicago, base	1.80c
Cleveland, delivered	1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.85c to 1.90c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	1.96½c

BARS

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.85c
Birmingham, base	1.90c to 1.95c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.75c to 1.80c
Cleveland, del., outside mills	1.82½c
Philadelphia, del.	2.04c to 2.09c
New York, delivered	2.08c
Boston, delivered	2.15c
Detroit, del.	1.95c to 1.98½c
Pittsburgh, cold finishing	1.90c
Pittsburgh, forging quality	2.00c

RAIL STEEL

Chicago Heights	1.75c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.90c
New York, delivered	2.03c
Philadelphia, delivered	1.99c to 2.04c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.00c to 2.05c
Stock lengths from mill	1.75c to 1.80c
Chicago billet, over 500 tons	1.85c
30 to 500 tons	2.00c
Under 30 tons	2.45c
Chicago, rail steel	1.65c to 1.70c
Road and bridge work	1.80c
Philadelphia, cut lengths	2.14c

CORROSION, HEAT RESISTANT ALLOYS

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets....35.00c; plates....31.00c; bars....28.00c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

SHEETS

SHEET MILL BLACK, No. 24

Pittsburgh, base	2.45c to 2.55c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.84c
Gary, Indiana Harbor	2.65c
Chicago, delivered	2.70c
Birmingham, base	2.75c
St. Louis, del.	2.97c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.15c
Philadelphia, delivered	3.44c
Gary, Indiana Harbor	3.30c
Chicago, delivered	3.35c
Birmingham, base	3.40c
St. Louis, del.	3.62c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base*	1.95c to 2.15c
Chicago, district mills	2.25c to 2.35c
Chicago, delivered	2.30c to 2.40c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.44c
Birmingham	2.35c

*Minimum price is on continuous mill product.

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base*	1.80c to 2.00c
Chicago, district mills	2.10c to 2.20c
Chicago, delivered	2.15c to 2.25c
Philadelphia, delivered	2.29c
St. Louis, delivered	2.42c
Birmingham	2.20c

*Minimum price is on continuous mill product.

AUTOMOBILE NO. 20

Pittsburgh, base	3.60c
Detroit, delivered	3.86½c

FURNITURE NO. 24

Pittsburgh	3.70c to 3.80c

(Turn to the following page)

age 73 per cent this week, against 75 last week. Chicago mills are holding at 70 per cent. Youngstown operations continue about 60 per cent, improvement at independent mills washing out the 10 per cent decline at Steel corporation plants.

The average this week for all Steel corporation plants is 71-72 per cent, against 72 last week. With independents this week at 61 per cent, down 3 points, the entire industry averages 66 per cent, compared with 68 last week and 71 two weeks ago. Last year the industry was operating at 95 per cent.

Most heartening of all markets is that for structural shapes. At New York alone well over 120,000 tons is pending, including 48,000 tons for an elevated roadway over the Jersey meadows, 43,000 tons for a previously-mentioned elevated roadway in New York, 20,000 tons for subways and 10,000 tons for a school at Brooklyn.

Shape Awards Over 40,000 Tons

This week's structural steel awards, topped by 6500 tons for a bank at St. Paul and 6000 tons for Yale university, total 41,300 tons, well above the average for the year to date and comparing with 27,378 tons in the corresponding week of 1929. For 1930 to date structural awards now total 901,098 tons; a year ago 1,113,000 tons. Declines this week in finished steel prices are more in the nature of adjustments and open recognition of concessions than in downright weakness. Galvanized sheets are more commonly 3.15c, Pittsburgh. Wide hot strip is now 1.65c, Pittsburgh, narrow hot strip 1.75c, and cold-rolled strip 2.45c. A $2.10 price on wire nails is more common. Relaying rails at Pittsburgh have been marked down $1 per ton and light rails $2.

Valley Pig Iron Is Reduced

Softness, however, honeycombs much of the pig iron price structure. Another reduction of 50 cents at Chicago brings the furnace price there down to $18. Lake iron at Chicago docks now is $17 to $18. Granite City, Ill., quotations are off 50 cents, sympathetic with Chicago. After being unchanged for 13 months, pig iron at Youngstown and Pittsburgh warrants a spread of 50 cents downward.

Building activity on the Pacific coast, as indicated by heavier demand for structural steel and concrete reinforcing bars, is moderately improved. Cast iron pipe sales in California last week were the largest in two months.

German producers of finished steel have reduced prices about $1 per ton, passing along the recent 7½ per cent reduction made in wages. Fixed price schedules are reported to be helping Belgian market somewhat. Reflecting in particular the softening of pig iron prices, the IRON TRADE REVIEW composite is down 8 cents this week to $33.44, giving this index an average of $33.53 for June, compared with $33.73 for May and $36.96 last June.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (June 25, 1930)	$33.44
Last week (June 18, 1930)	33.52
One month ago (May, 1930)	33.73
Three months ago (March, 1930)	34.95
One year ago (June, 1929)	36.96
Ten years ago (June, 1920)	67.89
Fifteen years ago (June, 1915)	23.74

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted on Last Editorial Page—See Preceding Page for Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	1.75c
Delivered, Detroit	2.01½c
Hot strip 6 1/16 to 24-in., Pitts.	1.65c
Delivered Detroit	1.91½c
Hot strip, bands 6 in. and under, Chicago	1.80c to 1.90c
Do. 6 1/16 to 24	1.75c to 1.85c
Cooperage stocks, Pittsburgh	2.00c to 2.10c
Do. Chicago	2.10c to 2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.45c
Delivered, Detroit	2.65c to 2.75c
Worcester, Mass., (3 tons and over)	2.60c to 2.70c

ALLOY STEEL

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanad'm	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same prices per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Bars, drawn or rolled, Pitts., Chicago and Buffalo	2.10c
Do. Cleveland	2.00c to 2.10c
Do. delivered, Detroit	2.20c
Shafting (turned, polished) Pittsburgh, Buffalo	2.10c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

(To Jobbers—Merchant Trade)

Standard wire nails	$2.10-2.15 and 2.25
Cement coated nails	2.15 and 2.25
Galvanized nails	4.15 and 4.25

(Per pound)

Polished staples	2.60c and 2.70c
Galvanized staples	2.85c and 2.95c
Barbed wire, galvanized	2.80c and 2.90c
Annealed fence wire	2.30c and 2.40c
Galvanized wire	2.75c and 2.85c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland base on products made there. Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, c.l., f.o.b. mills	2.45c to 2.55c
Cut nails, l.c.l., f.o.b. mills	2.55c to 2.65c
Sheet piling, base, Pittsburgh	2.00c to 2.10c

Chain proof BB and BBB, Pitts.

3/16-in. to ⅜-in.	33 1/3 and 5 off
9/16-in. to 1½-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birmingh'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	47.20 to 49.20
Six-inch to 24-inch, Chicago	43.20 to 45.20
Six-inch and over, New York	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE; TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24 3.65c to 3.75c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts., dist.	$6.50 to 6.75 off
Wrought, l.c.l., Chicago dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago	$6.70 to 6.80 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25 to 45, mills	$34.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

BOLTS AND NUTS

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of May 10, 1930.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.	
Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread	73 off
Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.	
Lag screws	73 off
Plow bolts, Nos. 1-2-3-7 heads	73 off
Tap bolts	73 off
Blank bolts	73 off
Stud bolts without nuts	73 off
Stove bolts, 80, 10, 10 and 5 off in pkgs.; 80, 10, 10, 5 and 2½ off in bulk.	
Tire bolts	60, 10 and 10 off

NUTS

Semifinished	73 off

***HEXAGON CAP SCREWS**

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-10 off

***SQUARE HEAD SET SCREWS**

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

*Discounts dated Jan. 23, 1930.

RIVETS

Struc. c.l., Pitts.-Cleve.	2.90c
Structural, c.l., Chicago	3.00c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	37.30
Chicago	32.00 to 33.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00 to 37.00
Forging, Philadelphia	42.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.70c to 1.75c

IRON ORE

LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% (contract)	10.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55%, iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phosphorus	11.00
Spanish and North African basic, 50 to 60%	9.50 to 10.00
Newfoundland foundry, 55%	9.00
Tungsten, spot and future, short ton unit, duty paid	12.00 to 12.50
Chrome ore, 48%, net ton c.i.f.	$21.50 to 22.50

MANGANESE ORE

Prices, not including duty, are cents per unit; cargo lots.

Caucasian (52-55 per cent)	30 cents
Indian (48-50 per cent)	30 cents
Brazilian (46-48 per cent)	28 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid enst. tide., gross ton	$19.50 to 20.50

REFRACTORIES

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per net ton.

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore base	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base	
9 x 4½ x 2½	45.00

Pig Iron

Third Quarter Inquiries Fail to Develop Business in Volume—Chicago, Valley and St. Louis Prices Marked Down

FURTHER price revisions at Chicago and the first reduction in the valley market in 13 months feature the pig iron market. Producers and consumers have moved to the threshhold of the third quarter with prospects of less business than in either the first or second quarter. While there is little tonnage in sight furnace interests are keen for orders. Northern iron now is offered at $18, base, by Chicago district furnaces. Valley foundry and basic are down to $18 and bessemer and malleable $18.50 for substantial orders. Prices at St. Louis also are easier. Buffalo furnaces quote $16, base, for eastern delivery. A few large tonnages have been placed by melters covering known requirements. Considerable iron remains to be shipped on second quarter contracts.

PITTSBURGH, June 24.—Buying of pig iron has dwindled to small proportions. New business and shipments are lighter than a month ago, with large orders and inquiries absent. Official announcement of price revisions is lacking but in view of shading on some tonnages ranges of 50 cents below the recent quotations on various grades are more representative of the market than the single figures prevailing for the past 13 months. This brings No. 2 foundry and basic to $18 to $18.50, valley, and bessemer and malleable to $18.50 to $19. The Pittsburgh district furnace quotes base price 50 cents above these levels. Small tonnages constitute the bulk of current sales and bring the top prices. The market for some time has lacked a test of large orders.

Boston, June 24.—Less than 1000 tons of pig iron was sold in this district in the past week Few inquiries are pending and the outlook is for a quiet third quarter. Prices are unchanged.

New York, June 24.—Pig iron buying is less active than a week ago, aggregating 6000 to 7000 tons. Inquiry totals 3000 to 4000 tons and includes approximately 1000 tons of foundry and malleable iron for a Connecticut melter. Worthington Pump & Machinery Corp., Harrison, N. J., previously noted as inquiring for 1500 tons, has placed a relatively small portion, possibly 400 tons, and has withdrawn from the market on the remainder. General Electric Co. has closed for about 600 tons on its recent inquiry for 1350 tons for its various eastern plants. New York Central railroad is inquiring for 300 tons of No. 2 foundry and No. 2X and No. 1X and a carload of charcoal iron. Buffalo iron is holding at $16 to $16.50, base, furnace, and southern iron is $18 to $18.50, delivered, New York docks.

Buffalo, June 24.—Pig iron inquiry totals about 3000 tons, of which 1200 tons is wanted by Eastern Malleable Iron Co., Naugatuck, Conn. Nearly 5000 tons of iron was sold by makers here in the past week. The district base is firm at $18.50, but $16 is quoted in the East to compete with southern iron.

Cleveland, June 24.—Sales of pig iron are fairly active but not all of the inquiries that came out a week ago have been closed. Some sellers say buyers showed more hesitancy immediately following the recession in stock market prices last week; others ascribe the dearth of business for third quarter to the fact melters do not have orders on which to apply iron. The week's sales by furnace interests with headquarters here totaled 13,000 tons, compared with 14,500 tons in the week preceding. Westinghouse Electric & Mfg. Co. has not closed on its inquiry for Cleveland and Trafford City, Pa. Worthington Pump & Machinery Corp. is understood to have closed for some iron for Buffalo and Cincinnati plants. New inquiry is light. Shipments show a slight improvement over prior weeks of this month. Cleveland furnaces hold to $18.50, base, for local delivery, and $18 for outside competitive points. In western Ohio and Indiana the lake furnace price continues $18, base and in Michigan $18.50 to $19.

Youngstown, O., June 24.—Pig iron sales are small and third quarter contracts are scarce. No. 2 foundry and basic are $18.50, furnace, and malleable and bessemer $19.

Chicago, June 24.—Tonnage inquiries for pig iron covering all or part of the third quarter have improved but sales have not reached an active stage. Several important orders have been closed. A northern Illinois melter is inquiring for about 900 tons of the base grade and high silicon foundry iron. A Milwaukee district melter closed on 2500 tons and a central Illinois farm equipment maker placed 1700 tons, the latter tonnage going under the recent market. Northern iron now is being quoted generally at $18, a reduction of 50 cents. Boat iron also has been reduced. Following the movement of some charcoal ironstocks by one seller at low prices the base quotation again is at $24, Lake Superior furnace. The newly announced higher prices on some grades of silvery iron are not assumed to cover the Chicago market as low offers continue to be made throughout the district.

Cincinnati, June 24.—Total sales of pig iron here during the past week slightly exceeded 2400 tons. An eastern Ohio melter is reported to have placed 2000 to 2500 tons with a Cleveland furnace. A Louisville, Ky., melter is inquiring for 200 tons of foundry iron. Prices are unchanged.

St. Louis, June 24.—Purchasing of

(*Concluded on Page* 89)

Pig Iron Prices

Per Gross Ton

FOUNDRY NO. 2	
Chicago, furnace	$18.00
Chicago, lake dock	17.00 to 18.00
Pittsburgh, district furnace	19.00
Pittsburgh, delivered	19.13 to 20.13
Valley, furnace	18.00 to 18.50
Cleveland furnace, local delivery	18.50
Philadelphia, delivered	19.76
Virginia, furnace	17.75
Granite City, Ill., furnace	18.50 to 19.00
Buffalo, furnace, local delivered	18.50
Buffalo, delivered Boston	21.41 to 21.91
Buffalo, del. all-rail, Brooklyn	20.91 to 21.41
Buffalo, delivered, all-rail, Newark	19.28 to 19.78
Ala., Birmingham fur., local del.	14.00
Alabama, delivered Chicago	18.01
Alabama, delivered St. Louis	17.42
Alabama, delivered Cincinnati	16.69 to 18.19
Alabama, delivered Cleveland	18.51 to 19.01
Alabama, Philadelphia dock del.	17.25 to 18.25
Alabama, Baltimore dock delivery	17.00 to 18.00
Alabama, New York dock delivery	18.00 to 18.50
Alabama, Boston dock delivery	20.21
Tenn., Birmingham base, local del.	14.00
Tennessee, delivered Cincinnati	16.69 to 18.19
Montreal, delivered	23.50
Toronto, delivered	22.10
FOUNDRY, NO. 2X	
Buffalo, furnace, local delivery	19.00
Buffalo, all-rail, Brooklyn	21.41 to 21.91
Buffalo, all-rail, Newark	19.78 to 20.28
Buffalo, delivered Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, delivered, Philadelphia	20.26
FOUNDRY, NO. 1X	
Buffalo furnace, local delivery	20.00
Eastern, delivered, Philadelphia	20.76
MALLEABLE	
Chicago, furnace	18.00
Chicago, lake dock	17.00 to 18.00
Cleveland furnace, local delivery	18.50
Pittsburgh district furnace	19.50
Pittsburgh, delivered	19.63 to 20.63
Valley furnace	18.50 to 19.00
Buffalo furnace, local delivery	19.00
Eastern Penn., delivered	19.76 to 21.41
Granite City, Ill., furnace	18.50 to 19.00
Montreal, delivered	24.00
Toronto, delivered	22.60
BASIC	
Pittsburgh district furnace	19.00
Pittsburgh, delivered	19.13 to 20.13
Eastern Penn., delivered	18.50 to 19.00
Buffalo furnace, local delivery	18.00
Montreal, delivered	22.50
Valley furnace	18.00 to 18.50
BESSEMER	
Valley, furnace	18.50 to 19.00
Pittsburgh, delivered	20.26 to 20.76
LOW PHOS	
Valley furnace, standard	27.00
Philadelphia, standard	24.26 to 24.76
Furnace, copper-bearing	23.00 to 23.50
GRAY FORGE	
Pittsburgh district furnace	18.50
Pittsburgh, delivered	19.13 to 19.63
CHARCOAL	
Lake Superior, delivered Chicago	27.04

SILVERY

Jackson County, O., furnace, in per cents.

5—$21.50; 6—$21.50; 7—$22.00; 8—$22.50 to $23.00; 9—$23.00 to $24.00; 10—$23.50 to $27.00; 11—$24.50 to $28.00; 12—$25.50 to $30.00; 13—$26.50 to $32.00.

BESSEMER FERROSILICON

Jackson County, O., furnace, in per cents.

10—$29; 11—$31; 12—$33; 13—$35; 14—$37; 15—$39; 16—$42; 17—$45.

The Market Section

Coke

Business Quiet—Furnace Fuel Softer — Foundry Consumption Lower—Beehive Output Steady

THE market for beehive coke shows an easier trend. Makers continue to quote $2.50 on the standard grade but fuel below standard is going at 10 cents less. Concessions are reported in eastern markets. Standard beehive foundry coke is held at $3.50 to $4.85, and premium brands are firmer. Consumption of foundry coke shows a moderate decline with the market unchanged.

Pittsburgh, June 24.—Beehive coke remains in the doldrums. New buying of furnace coke amounts to little although shipments on contracts are fairly steady. The price is held at $2.50 for the standard grade of furnace fuel. Little surplus is noted on tracks. Inferior grades are going at 10 cents less. Consumption of foundry coke is declining but the market is unchanged at $3.50 to $4.85. Premium brands are firmer at higher figures.

Production of coke in the Connellsville region for the week ended June 14 was 31,480 tons compared with 32,200 tons the preceding week and 110,450 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston, June 24.—Foundries have practically ceased to take coke from local ovens for the past two weeks. Contract quotas are far above users' requirements.

Detroit, June 24.—By-product foundry coke continues $8.50, ovens, or $9, delivered Detroit. Shipping orders are light, reflecting slacker automotive castings requirements.

Cincinnati, June 24.—The market for by-product foundry coke is dull. Specifications are held to a low level. Prices are unchanged at $10, delivered, Cincinnati.

St. Louis, June 24.—Further decrease is noted in shipments of coke. Contracting for third quarter is considerably below the average for this time in the past five years. Prices are unchanged.

New York, June 24.—Coke continues weak. Beehive furnace fuel is unchanged at $2.50 to $2.60, Connellsville, and standard grades of beehive foundry coke, $3.50 to $3.75. Premium brands of foundry coke are $4.85, Connellsville. By-product coke is $9.40, Newark; $11, New England; and $9, Philadelphia.

Birmingham, Ala., June 24.—Coke shipments are in light volume, but steady. A few sales have been made for the last half. By-product foundry fuel continues $5, base Birmingham.

Coke Prices

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.50
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	6.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	8.50
Philadelphia, del.	9.00

Ferroalloys

Shipments Lower—Special Alloys Are Easier

New York, June 24.—Domestic spiegeleisen, 19 to 21 per cent, is steady at $34, furnace, in carload lots, and ferromanganese is $99, duty paid, to users of carloads to 500 tons annually. Shipments are less active.

Tungsten prices have been reduced further. Wolframite ore is little over $4 a short ton unit, in bond, or $12 to $12.50, duty paid. The market is dull and exact quotations are difficult to name. Domestic scheelite is held nominally at $15. Other ferroalloys are quiet and unchanged.

Pittsburgh, June 24.—Further decline is noted in ferroalloy shipments, which are at the lowest level so far this year. The movement of ferrochrome is off slightly, though still at a fair seasonal rate. Ferrotungsten continues dull, the market remaining easy as a result of continued weakness in the ore market. Ferrotungsten generally is $1.15 to $1.20. Prices on ferromanganese and spiegeleisen are unchanged at $103.79, delivered Pittsburgh, and $34, furnace, respectively.

Bolts, Nuts, Rivets

Specifications Smaller—Third Quarter Contracts Develop

NUT AND BOLT PRICES, PAGE 74

Pittsburgh, June 24.—Further decline is noted in specifications for bolts nuts and rivets and operations also are dropping, currently averaging 55 to 60 per cent. Third quarter contracting is about 75 per cent complete with prices steady at 73 off for bolts and nuts and 3.10c, Pittsburgh, for large rivets.

New York, June 24.—One of the largest rivet orders placed in this district in some time involves 1700 tons for the New York Shipbuilding Co., Camden, N. J., booked by the local office of the Pittsburgh Screw & Bolt Co. The rivets are to be used in the construction of the two 30,000-ton vessels recently awarded the Camden yard by the United States Lines.

Cleveland, June 24.—Some nut, bolt and rivet plants are down to a 45 to 50 per cent basis. Others are not doing that well. Orders are scarce. Specifications are withheld. Users do not show any anxiety to contract for third quarter.

Chicago, June 24.—Weakening specifications for bolts, nuts and rivets since the first quarter have reached their lowest point of the year. Indications are that specifications are more than 50 per cent under a year ago and June has dropped sharply from last month. Third quarter contracting virtually will be completed within a week. Prices are unchanged on the basis of 64 to 73 off for carriage and machine bolts.

Ontario to Survey Ore

Toronto, Ont., June 24.—A survey of iron ore deposits in the province of Ontario will be made under direction of the department of mines. Dr. M. E. Hurst of the geological branch has been assigned to the work. He will co-operate with the Ontario Research Foundation now studying beneficiating methods. Numerous inquiries have been received since the government established a bounty of 1 cent per unit of iron for all the ore mined in Ontario.

Iron ore in the Kuznetsk district, Russia, averages between 56 and 61.5 per cent.

Ferroalloy Prices

(In dollars, except Ferrochrome)

*Ferromanganese, 78 to 82 per cent tidewater, duty paid	$99.00
*Ferromanganese del. Pittsburgh	103.79
Spiegeleisen, 19 to 21 per cent, domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	88.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.15 to 1.20
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91 00
Ferrophosphorus, electrolytic, per ton carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Scrap

Quiet Weakness Rules in Absence of Demand—Prices Move Slightly Downward

SUCH movement of prices for iron and steel scrap as are made are downward, but the market is listless and changes are small. Not much is being accumulated, industrial production is light and collections are at a minimum. Steelworks use more direct iron and less scrap. Some prices are at a level of several years ago.

Chicago, June 24.—While general weakness prevails in iron and steel scrap, prices for most commodities show little change as dealer trading is light and consumer bookings few. Due to slow accumulations resulting from the weak market, yard production is down. A tendency has developed for a number of foundry grade melters to lay down scrap reserves, particularly consumers in the railroad supply field. Steelworks melters, on the other hand, continue to use more of the output of their blast furnaces and less cold metal and are not building reserve supplies. Several melters of cast borings have heavy stocks, accumulated during many months. Cast borings remain at $7.75 to $8.25, while heavy melting steel is nominal at $12 to $12.50. Machinery cast and railroad malleable grades are extremely weak.

Boston, June 24.—Trading by scrap interests in the past week was the smallest of the month. Prices showed further slight decline with no prospects of much better conditions. Some heavy melting steel has been shipped, with price remaining firm.

New York, June 24.—Further down-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston, dealers	9.00 to 9.25
Buffalo, No. 1	13.25 to 14.00
Buffalo, No. 2	11.25 to 11.75
Chicago	12.00 to 12.50
Cincinnati, deal	11.00 to 11.50
Cleveland, No. 1	12.00 to 12.50
Cleveland, No. 2	11.25 to 11.75
Detroit, No. 1 deal	11.00 to 11.50
Detroit, No. 2 deal.	9.50 to 10.00
East Pa., del. mill	13.00 to 13.50
N. Y. deal R. R.	9.00 to 9.50
N. Y. deal No. 2	7.00 to 7.50
N. Y., deal. yd.	6.25 to 6.75
Pittsburgh No. 1	14.75 to 15.25
St. L., No. 1 sel.	11.25 to 11.75
Federal, Ill.	11.00 to 11.50
Granite City, Ill.	10.00 to 10.50
Valleys, No. 1	15.50 to 16.00

COMPRESSED SHEETS

Buffalo (dealers)	11.25 to 11.75
Chicago	10.50 to 11.00
Cleveland	11.50 to 11.75
Detroit, dealers	10.50 to 11.00
E. Pa. new mat.	12.00 to 12.50
Pittsburgh	14.50 to 15.00
Valleys	15.00

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cincinnati, deal.	10.25 to 10.75
Cleveland	9.00 to 9.25
Eastern Pa.	10.00
Pittsburgh	12.50 to 13.00
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	7.75 to 8.75
Buffalo	16.25 to 16.75
Chicago (3 ft.)	14.00 to 14.50
Chicago (2 ft.)	14.50 to 15.00
Cincinnati, deal.	17.00 to 17.50
Detroit, dealers	15.00 to 15.50
Pittsburgh, (open-hearth, 3 ft. and less)	17.00 to 17.50
St. Louis	15.75 to 16.00

STOVE PLATE

Birmingham	10.00 to 11.00
Boston, consumers	9.50 to 10.00
Buffalo	11.00 to 11.50
Chicago, net	9.50 to 10.00
Cinn., deal. net	8.25 to 8.75
Detroit, net, deal.	9.00 to 9.50
Eastern Pa.	10.00
N. Y., deal., mill	6.25 to 6.50
St. Louis	9.25 to 9.75

COUPLERS, SPRINGS

Buffalo	16.25 to 16.75
Chicago	13.50 to 14.00
Eastern Pa.	18.50 to 19.00
Pittsburgh	17.50 to 18.00
St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	10.50 to 10.75

LOW PHOSPHORUS

Buffalo, billets and bloom crops	17.50 to 18.00
Cleve. billet and bloom crops	17.50
Eastern Pa.	19.50 to 20.00
Pitts. billet and bloom crops	19.00 to 20.00
Pitts. Sheet bar crops	18.00 to 18.50

FROGS, SWITCHES, GUARDS

Chicago	13.00 to 13.50
St. Louis	11.00 to 11.50

SHOVELING STEEL

Chicago	12.00 to 12.50
Cleveland	9.00 to 9.50
St. Louis	10.50 to 11.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 10.50
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago, No. 1	11.25 to 11.75
Chicago, No. 2	12.00 to 12.50
Cincinnati, No. 2	11.00 to 11.50
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 deal.	11.75 to 12.00
Pittsburgh, No. 2	14.75 to 15.2
St. Louis, No. 1	9.00 to 9.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	7.00 to 7.50
Eastern Pa.	12.50
New York, deal.	7.75 to 8.25

BUSHELING

Buffalo, No. 1	11.50 to 13.00
Chicago, No. 1	10.00 to 10.50
Cinn., No. 1 deal.	9.25 to 9.75
Cinn., No. 2	6.25 to 6.75
Cleveland, No. 2	8.25 to 8.75
Detroit, No. 1 new deal.	9.75 to 10.25
St. Louis, No. 1	9.50 to 10.00
Valleys, new No. 1	15.00

MACHINE SHOP TURNINGS

Birmingham	7.50 to 8.50
Boston, dealers	4.00 to 4.50
Buffalo	8.75 to 9.00
Chicago	6.50 to 7.00
Cincinnati, deal.	7.50 to 8.00
Cleveland	7.75 to 8.25
Detroit	6.00 to 6.50
Eastern Pa.	9.00
New York, deal.	5.00 to 5.50
Pittsburgh	9.50 to 10.00
St. Louis	6.75 to 7.25
Valleys	11.25 to 11.75

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	4.00 to 4.25
Buffalo	9.75 to 10.00
Cincinnati, deal.	8.00 to 8.50
Cleveland	9.00 to 9.50
Detroit, dealers	7.25 to 7.75
Eastern Pa.	8.50
New York, deal.	4.25 to 5.00
Pittsburgh	9.50 to 10.00

CAST IRON BORINGS

Birmingham, chem.	12.00 to 13.00
Birmingham, plain	7.50 to 8.50
Boston, chem.	9.00 to 9.50
Boston, dealers	4.00 to 4.35
Buffalo	9.75 to 10.25
Chicago	7.75 to 8.25
Cincinnati, deal.	8.00 to 8.50
Cleveland	9.00 to 9.50
Detroit, dealers	7.50 to 7.75
Eastern Pa.	9.00
Eastern Pa., chem	14.00 to 14.50
New York, deal.	6.50
Pittsburgh	9.50 to 10.00
St. Louis	9.25 to 9.50

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	9.50 to 10.00
Chicago, net	8.50 to 9.00
Cincinnati	9.00 to 9.50
Eastern Pa.	10.00
New York, deal.	7.75
St. Louis	10.00 to 10.25

FORGE FLASHINGS

Boston, dealers	6.75 to 7.50
Buffalo	11.25 to 11.75
Cleve. over 10 in.	10.50 to 11.00
Detroit	9.50 to 10.00

FORGE SCRAP

Boston, dealers	7.00 to 7.25
Chicago	14.50 to 15.00
Eastern Pa.	12.50 to 13.00

ARCH BARS AND TRANSOMS

Chicago, net	13.75 to 14.25
St. Louis	14.00 to 14.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	12.00 to 12.50
Chicago steelworks	9.50 to 10.00
Cleveland	12.00 to 12.25
Eastern Pa.	11.00 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston, ship point	15.50 to 16.00
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	22.00
St. Louis	16.00 to 16.50

SHAFTING

Boston, ship point	12.50 to 13.00
Chicago	16.25 to 16.80
Eastern Pa.	18.00 to 18.25
New York, deal.	13.00 to 14.00
St. Louis	16.00 to 16.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	16.25 to 16.75
Chicago, iron	13.50 to 14.00
Chi., rolled steel	15.00 to 15.50
Cincinnati	12.00 to 12.50
N. Y., iron, deal.	10.50 to 11.00
Pittsburgh, iron	15.50 to 16.00
Pittsburgh, steel	17.50 to 18.00
St. Louis, iron	12.00 to 12.50
St. Louis, steel	13.75 to 14.25
East Pa. steel	18.50 to 19.00
East Pa. iron	15.00

NO. 1 CAST SCRAP

Birmingham, cup.	12.00 to 13.00
Buffalo	12.00 to 12.50
Boston, textile	11.50 to 12.00
Chicago, mach.	14.00 to 14.55
Chicago, railroad	11.20 to 11.75
Chicago, agri.	11.20 to 11.75
Cincinnati, mach. cupolas, gross	17.75 to 18.25
Cleveland, cupola	14.00 to 14.50
Detroit, net deal.	10.00 to 10.50
East Pa. cupola	14.50 to 15.00
N. Y. cup. deal.	9.50 to 9.75
N. Y., del. local foundries	14.00
Pittsburgh, cupola	14.00 to 14.50
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 mach.	12.00 to 12.50
St. Louis, No. 1	11.00 to 11.50

HEAVY CAST

Boston	10.50 to 11.00
Boston, mach. cast	14.00 to 14.50
Buffalo, breakable	8.50 to 9.00
Cleve., breakable	9.00 to 9.50
Detroit, auto, net Dealers	11.50 to 12.00
Det., break., deal.	7.00 to 7.50
Eastern Pa.	12.25 to 12.75
N. Y. No. 1 deal.	8.50 to 8.75
N. Y. break. deal	7.25 to 8.60
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston, railroad	15.00 to 15.50
Buffalo	15.50 to 16.00
Chicago, agri.	12.25 to 12.75
Chicago, railroad	13.50 to 14.00
Cinn., R. R. deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	16.00 to 16.50
Detroit, auto deal.	13.50 to 14.00
St. Louis, rail	12.00 to 12.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham, cup.	12.00 to 13.00
Boston	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	14.50 to 15.00
Eastern Pa.	15.00 to 15.50
New York	10.00 to 10.50
St. Louis	12.50 to 13.00

LOCOMOTIVE TIRES

Chicago, cut	15.00 to 15.50
St. Louis No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.50 to 14.00
Pittsburgh	17.50 to 18.00
Eastern Pa.	18.00 to 19.00
Buffalo	17.00 to 17.50

ward revisions have been made in the dealers' scrap market here. Mixed borings and turnings are now holding at $4.25 to $5, the inside figure having been recently established on a tonnage for Steeleton, Pa., and clean cast turnings at $5 to $5.50, New York. Due in part to a 50-cent reduction at Harrisburg, Pa., and Florence, N. J., the local market on heavy breakable cast is down to a spread of $7.25 to $8.60. No. 1 heavy cast and No. 1 machinery cast are holding at $8.50 to $8.75 and $9.50 to $9.75.

Buffalo, June 24.—A Buffalo consumer has purchased a tonnage of selected No. 1 heavy melting steel at $13.85 delivered. This is the lowest price at which this grade has been sold here since 1921, or perhaps since 1914. A consumer who took prices on 1800 tons of No. 1 cast for delivery over the rest of the year withdrew the inquiry when dealers refused to quote for so long a period and is now asking quotations on 400 to 500 tons for early delivery.

Cleveland, June 24.—Iron and steel scrap prices are again lower with consuming demand at still lower ebb. Dealer orders for one large mill have been nearly completed and shipments to the second have been further checked. Movement by boat from Detroit has also tapered. No. 1 heavy melting steel has settled to a range of $12 to $12.50, against a top of $13 last week. No. 2 steel is also lower at $11.25 to $11.75. Hydraulic compressed sheets have declined to a range of $11.50 to $11.75 from the flat price of $12 prevailing last week.

Cincinnati, June 24.—Recent railroad lists of iron and steel scrap, an aggregate of about 18,000 tons, tested and gave support to quotations here of $11 to $11.50 for heavy melting steel and No. 2 railroad wrought. With this support other grades withstood the influence of a duller market and prices are nominally unchanged.

Detroit, June 24.—Iron and steel scrap prices are further weakened by reductions in turnings, long steel rails and forge flashings. Demand from Pittsburgh, Youngstown and Cleveland consumers is lighter, as are offerings by automotive producers of scrap.

St. Louis, June 24.—Activities in iron and steel scrap have receded further within the past week or ten days. There is virtually no buying except of small lots for immediate delivery. Melters needing specialties for mixing purposes take only bare requirements. Mills show no interest whatever in third quarter needs. Most foundries and machine shops are carrying larger tonnages than expected into July. Prices were again lower.

Birmingham, Ala., June 24.—With no change in quotations and consumers manifesting little concern in scrap needs, market conditions are about the same.

Philadelphia, June 24.—Buying is of scattered character with price tendencies still downward on some grades. Borings have been reduced to $9 and blast furnace mixed borings to $8.50.

Pittsburgh, June 24.—Iron and steel scrap is steady and quiet. Heavy melting steel was sold recently in moderate lots at $15 and higher, leaving it quotable at $14.75 to $15.25. Compressed sheets are lower, with $15 the top price. Low phosphorus grades are dull and unchanged. Blast furnace material is in poor demand.

Toronto, Ont., June 24.—Resale demand for iron and steel scrap is dull and dealers do not look for improvement until after the holiday season. Toronto and Montreal dealers have revised buying prices, reductions ranging from 50 cents to $4 a ton.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$15.00
Steel axles	13.00
Car wheels	11.00
Stove plate	10.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	8.00

TORONTO

Steel axles	10.00
Iron axles	12.00
Heavy melting steel	9.00
Turnings	6.50
No. 1 mach. cast (net)	11.00
Malleable (net)	9.00

Semifinished Steel

Third Quarter Contracts Lacking—Shipments Slower

SEMIFINISHED STEEL PRICES, PAGE 74

Pittsburgh, June 24.—New business in semifinished steel continues dull and shipments are tapering, reflecting the trend in finishing operations. Seamless tube mills, however, are taking steel in good volume. Semifinished steel producers are not anxious to book new contracts at present prices which they believe represent the bottom of the market. Billets, sheet bars and slabs generally are $31, with wire rods continuing $36.

Philadelphia, June 24.—Billet sales so far this month show a decrease of 10 per cent compared with the same number of days in May. Prices are unchanged at $32, base, Pittsburgh, for rerollers, and $37 for forging quality. Wire rods continue $36, base, Pittsburgh, with specifications slightly smaller than last week.

Youngstown, O., June 24.—A little more interest is noted in the market for sheet bars, with several independent sheetmakers starting a few more units. One additional open-hearth furnace has been added to the independent active list, making 28 active out of a total of 53 in the district. Bessemer operations are at 60 per cent. Sheet bars, billets and slabs are holding at $31, Pittsburgh and Youngstown.

Cleveland, June 24.—Demand for sheet bars, billets and slabs shows further signs of moderating. The leading merchant producer here has dropped one more open-hearth furnace, now operating five of its 14. No contracts naming specific prices for third quarter have been booked, but users will continue to take tonnage as needed from usual sources of supply at prices prevailing at time of shipment. Sheet bars, billets and slabs are $31, base, Youngstown and Cleveland.

Chicago, June 24.—Semifinished steel shipments have declined but spot sales are fairly active. Producers are quoting $32 to $33, base, for billets, blooms and slabs, but quotations are regarded as nominal. Wire rods are unchanged at $37, Chicago.

Operating Rates

Steelmaking Slump Continues As All Districts Show Further Reduction

Chicago—Ingot output is at 70 per cent. Twenty-one of 36 steel works blast furnaces are blowing. Finishing mill operations are virtually unchanged from a week ago, except sheet rolling down to 50 per cent compared with 60 to 65 last week.

Pittsburgh.—Ingot operations are lower at 65 per cent. Considerable variation is shown from this average, some independents continuing around 80, with others as low as 30. Sheet output continues 50 to 55, with tin plate 75 to 80. Strip is lower at 55 to 60, with pipe unchanged at 75.

Buffalo.—Curtailment brings operations to 73 per cent of the open-hearth capacity, compared with the recent 75 per cent average. Further declines may take place between now and July 4, when a general drop in output is anticipated.

Cleveland.—Steelmaking has receded further and this week will stand at 41 per cent. Fourteen of 34 open-hearth furnaces are reported producing, each of the three producers of last week having taken off an open hearth apiece. There is little prospect for any marked upward revision in operations.

Youngstown, O.—Operations will recede to about 60 per cent this week due to the 10 per cent curtailment reported by Corporation plants located here. Local Carnegie plants which had been operating steadily between 65 and 70 per cent, announced a reduction to 55 to 60 per cent beginning Monday. Independent steel operations are slightly better, with 28 of 51 open-hearth furnaces in operation and bessemer output at 60 per cent. Sheet mill operations show a good gain from 47 to 63 of the 120 independent units. Two idle plants resumed this week, but schedules in most instances do not call for full turn operations. Strip mill operations are at 70 per cent, a slight increase, and tin plate output is averaging about 70 per cent. Pipe mills continue busy, with additional lap-weld furnaces lighted bringing production to about 65 per cent.

Birmingham, Ala.—Open-hearth furnaces in operation are producing around 60 to 65 per cent. Steel fabricating shops are operating a little better than 60 per cent.

Bars

Light Orders Bring Production to Low Level—Prices Hold Well Against Dull Outlook

CHICAGO producers of soft steel bars, who have been more active than those in the East, have felt the decline in buying and are operating at 65 per cent of capacity. Occasional inquiry is received for third quarter tonnage. Expected shortening of automotive needs adds dullness to the outlook, while implement makers are starting their inventory and vacation season.

BAR PRICES, PAGE 73

Chicago, June 24.—Bar mills are barely maintaining 65 per cent operations. Although orders are in light tonnage, they are well distributed among miscellaneous manufacturing users. Excavating and road building equipment sales are moderately heavy. One producer of bars and other finished products reports a gain in his specifications in the week just closed, which showed one of the highest totals since March. Sales, spot and contract, are up to recent totals, with occasional inquiry for third quarter. Not much is expected from the implement and tractor works for at least 60 days. Bar iron remains at 1.90c, Chicago, while soft steel bars are unchanged at 1.85c.

New York, June 24.—Commercial steel bars continue firm at 1.75c, Pittsburgh, with deliveries ranging from two to three weeks. There is fair contracting for third quarter at 1.75c.

Philadelphia, June 24.—Steel bar demand has fallen off considerably here but prices are unchanged, 1.75c to 1.80c, base, Pittsburgh.

Pittsburgh, June 24.—Bar specifications show a further decline with new business usually confined to small lots. Contracting for third quarter is quiet, with the market fairly steady at 1.75c, Pittsburgh. The outlook remains dull as the result of prospective decline in automotive requirements. Fairly brisk concrete bar demand is aiding bar mill operations.

Detroit, June 24.—Soft steel bar demand appears headed into the lightest period of the year, Specifications for July indicate automotive production will be considerably under June, which in turn shows a loss from May. Practically all important automotive manufacturers will be down for at least two weeks in July, with some vacations running over into August. Consumers go into this period with inventories negligible, assuring a better condition for mills if the usual fall pickup develops. Cleveland mills offer bars at 1.75c, base, Cleveland.

Cleveland, June 24.—Bookings of hot rolled merchant steel bars are commencing in earnest to reflect the curtailed consuming rates in automotive and allied lines. Miscellaneous consumers order as needed, mostly in small lots. These without extended automotive support make for unsatisfactory rolling schedules at bar mills. The price continues 1.75c, Cleveland, for outside shipment and 1.75c to 1.80c, Cleveland, for local delivery.

Is Elected President of Electrical Engineers

William S. Lee, consulting engineer and president, W. S. Lee Engineering Corp., Charlotte, N. C., was elected president of the American Institute of Electrical Engineers for the year beginning Aug. 1. The election was announced at the annual summer meeting of the institute at Toronto, Ont., June 23. Other officers elected at the same time were: Vice presidents, I. E. Moultrop, Boston; H. P. Charlesworth, New York; T. N. Lacy, Detroit; G. C. Shaad, Lawrence, Kans.; and George A. Hamilton, Elizabeth, N. J. The national treasurer, was reelected.

Forms Columbia Steel Co.

New York, June 24.—Columbia Steel Co., a Delaware corporation and subsidiary of the United States Steel Corp., has acquired the properties and business of the Columbian department of the United States Steel Products Corp. The Columbia Steel Co. will operate the properties of the former Columbia Steel Corp., acquired by the Corporation last January. Distribution on the Pacific coast of the products of other manufacturing subsidiaries of the Steel corporation will be conducted by the new company, which will be headed by A. T. De Forest, president.

Chicago Cutting Die Co. has changed its capital from $20,000 to 1100 shares no par value.

Plates

Ship and Pipe Work Feature Market—Busy July and August Indicated in Middle West

SHIPBUILDING continues the mainstay of the eastern plate market. Two vessels for the Colombian Steamship Co. will take 12,000 tons of steel, including 8000 tons of plates. The outlook in the Middle West is for a fairly active market through July and August. Operations by Chicago district mills are maintained at 85 per cent. Shipments of plates for pipe work are active.

PLATE PRICES, PAGE 73

Chicago, June 24.—Plate mills continue to lead in finishing mill operations at about 85 per cent, with shipments corresponding to production. Tank fabricators have booked about 1000 tons for oil country storage. Probably 15,000 tons are on inquiry for storage work, a portion of which is inactive now. Shipments of plates to Milwaukee for pipe line work are expected to continue at the present rate through most of July and August. A few of the larger buyers have shown some interest in third quarter, but business closed is small Plate sales are based on 1.80c, Chicago.

New York, June 24.—Plate demand is fair, with the market steady at 1.80c to 1.85c, Coatesville, Pa. A feature is the opening of bids on two vessels for the Colombian Steamship Co., 17 Battery Place, requiring approximately 12,000 tons of steel of which 8000 tons are plates. The Dravo Contracting Co. is reported to have received a contract for the construction of two derrick barges for the New York Central railroad, requiring a total of 500 tons of plates. Cerro de Pasco Copper Co. has placed 1000 tons for a penstock to be constructed in Peru. Oakdale Contracting Co. is low on the general contract for supplying and installing 1000 tons of 30-inch steel pipe for the New York department of water supply, gas and electricty. One thousand tons of 36-inch pipe for Kearny, N. J., have been awarded through the North Jersey Construction Co. Inc., the contract going to the East Jersey Pipe Co., Paterson, N. J.

Buffalo, June 24.—Great Lakes Dredge & Dock Co. is reported to have placed 1200 tons of sheet piling for foundations of Ford Motor Co.'s plant now being built on a site on the outer harbor here. It is understood the order was booked by a Buffalo mill.

Pittsburgh, June 24.—Plate business is quiet, although recent tonnage shows little further decrease. Tank work continues light and freight car builders are buying sparingly. The barge market is inactive. Plates generally continue 1.70c, Pittsburgh, with

lower prices occasionally noted on attractive tonnages.

Philadelphia, June 24.—Current plate orders represent about a 10 per cent improvement over the comparable period in May. Eastern mills are operating at 55 to 85 per cent of rolling capacity. The price continues 1.80c, base, Pittsburgh, with the usual differentials to a certain class of consumers and jobbers all of whom are able to get concessions on plates by reason of lower prices at which they can buy shapes. Bethlehem Steel Co. will supply all of the steel for two new vessels for the United States Lines, amounting to about 30,000 tons of plates, shapes and bars.

Cleveland, June 24.—Moderate size orders for plates continue active from a large number of different consuming lines. The aggregate is sufficient to maintain a 65 to 75 per cent operating schedule. Concrete mixer manufacturers are active. Automatic shovel builders are not as busy as a few weeks ago. Boiler shops and heavy machinery builders are contracting for third quarter at 1.70c, Pittsburgh. Present active inquiry rate is encouraging and a pickup is expected in July.

CONTRACTS PLACED

1000 tons, 36-inch steel pipe, Kearny, N. J., through North Jersey Construction Co. Inc., to East Jersey Pipe Co., Paterson, N. J.

1000 tons, penstock, Cerro de Pasco Copper Co., for construction in Peru, South America, to Chicago Bridge & Iron Works, Chicago.

500 tons, two derrick barges, New York Central railroad, reported placed with Dravo Contracting Co., Pittsburgh.

300 tons, 20-inch welded pipe for San Francisco, to Western Pipe & Steel Co., San Francisco.

250 tons, steel barge for Foss Co., Seattle, divided between Bethlehem Steel Corp. and A. M. Castle & Co., Seattle, through Lake Washington Shipyards, Seattle, general contractors.

200 tons, 3 and 6-inch welded pipe, two 20,000-gallon tanks and two 25,500-barrel tanks for Parr-Richmond Terminal Corp., Richmond, Calif., to Steel Tank & Pipe Co., Berkeley, Calif.

150 tons, gas holder for Santa Maria Gas Co., Lompoc, Calif., to Consolidated Steel Corp., Los Angeles.

CONTRACTS PENDING

8000 tons, two vessels for Colombian Steamship Co., New York. Bids opened.

1000 tons, 30-inch steel pipe, department of water supply, gas and electricity, New York; Oakdale Contracting Co. low on general contract.

May Exports Slump Badly

Washington, June 24.—May exports of iron and steel products totaled 196,120 tons and were smaller by 12,520 tons than April, according to preliminary reports from department of commerce. Exports will show the smallest total in over 17 months. Imports dropped 353 tons to show 52,297 tons for May. With the greater part of a 11,395-ton gain in scrap exports to Canada, trade with that country rose to 87,060 tons.

Pipe

4000 Tons Let in East—Los Angeles Buys 2538 Tons—10,000 Tons Line Pipe Placed

FAIR size lettings are topped by 3000 tons for Newcastle water district, New York, 2538 tons for Los Angeles, and 1000 tons for Beacon, N. Y. The Los Angeles order was divided among five, American Cast Iron Pipe Co., receiving 1375 tons. Glamorgan Pipe & Foundry Co. is low on 1700 tons for Wisconsin Rapids, Wis. Most inquiries are small. Youngstown, O., mills share in line pipe.

PIPE PRICES, PAGE 74

Pittsburgh, June 24.—The pipe market is quieter in large pipe lines. Only a few remain to be placed. Some of these, including Standard Oil Co. of New Jersey, and Columbia Gas & Electric projects, are believed to have been entered at least tentatively on producers' books. Republic Steel Corp. and Youngstown Sheet & Tube Co. have been awarded portions of the large Missouri-Kansas Pipe Line Co. job, originally announced a number of weeks ago as placed with National Tube Co. by National Supply Co., Toledo, O. Mills in this district are in a favorable position to maintain full operations on 8-inch and larger pipe through the remainder of the year. Standard pipe remains seasonally slow but better business is looked for during the latter half of the year than during the first six months. Tonnage in oil country goods and various forms of tubing continues fairly steady. Mill operations hold 75 per cent.

Boston, June 24.—Cast pipe prices are holding firm on a basis of $36 to $37, eastern foundry, with differentials of $3 to $4 for class A and gas pipe. Awards are not heavy. United States Pipe & Foundry Co. was awarded 350 tons of cement-lined pipe for Providence, R. I. Pending volume includes about 300 tons of 30 and 48-inch cast pipe for New Haven, Conn., and 115 tons of 10 and 12-inch for Lowell, Mass.

New York, June 24.—Two of the largest pending tonnages of cast iron pipe, involving 3000 and 1000 tons, respectively, have been placed, both going to United States Pipe & Foundry Co. The same interest took 500 tons for Manhattan, N. Y. A water supply system for Allendale, N. J., has also been awarded. Pending volume and inquiry is down from recent weeks. Prices are firm and generally unchanged at $37, eastern foundry. Small orders are fairly numerous, calling for a car or two at a time.

Youngstown, O., June 24.—Mills in this district continue to fill up with additional lapwelded and electric welded pipe orders. To the large line pipe tonnages already on books of principal makers there is being added some fairly good business in buttwelded, or building construction pipe. The second electric-welded 10-inch pipe mill of Republic Steel Corp. now is operating and is working steadily out of the experimental stage, while the first, a smaller sized mill of that type, is filled up with business for some time to come. In fact pipe mills appear to have all the business they can take care of until late autumn.

Cleveland, June 24.—Jobber orders for buttweld full weight merchant pipe are still scarce. An occasional mixed carload order for prompt needs is noted. A fair sized tonnage will be required for Cleveland's lake front stadium and a smaller quantity for the local board of education's headquarteres building. Youngstown, O., mills expect to share this business. Youngstown Sheet & Tube Co.'s $5,000,000 electric welding pipe mill at Youngstown which goes into operathis this month has a 30,000-ton capacity.

Chicago, June 24.—Leading in inquiries before the market is 1700 tons of large size pipe for Wisconsin Rapids, Wis. It is understood steel and cast pipe are being considered. Tabulation of bids for the 200 to 500 tons of 4 and 16-inch cast pipe for Chicago show firm quotations on 4-inch. Glamorgan Pipe & Foundry Co. bid $47.70, delivered, or $39.50, base Birmingham. This bidder also was low on the 16-inch, but the base price figures about $36.50. Inquiries in Ohio and Michigan are light, but a number of small jobs in northern Illinois and Wisconsin are maintaining fair business for the contractors. Utility companies are buying moderately. Industrial orders have dropped off.

Birmingham, Ala., June 24.—Lettings of cast pipe are slow and tonnage is much under the record of early spring. Quotations are firm at $37 to $38 for 6-inch and larger sizes.

CONTRACTS PLACED

3000 tons, 6 to 18-inch cast pipe class C and D for Newcastle water district, New York, to United States Pipe & Foundry Co., East Burlington, N. J.

2538 tons, Los Angeles, allocated as follows: To National Cast Iron Pipe Co., 335 tons, 16 and 20-inch class 150; to American Cast Iron Pipe Co., 1375 tons 24-inch class C and 12-inch class 150; to Grinnell Co., 102 tons, 24-inch class B; to United States Pipe & Foundry Co., 363 tons 20-inch class 150, and to Pacific States Cast Iron Pipe Co., 363 tons of 20-inch class 150.

1000 tons, 10-inch cast pipe, for Beacon, N. Y., to United States Pipe & Foundry Co., East Burlington, N. J.

500 tons, 6 to 12-inch cast pipe for Manhattan, N. Y., to United States Pipe & Foundry Co., East Burlington, N. J.

425 tons, 6 to 12-inch cast pipe for Allendale, N. J., to R. D. Wood & Co., Florence, N. J.

350 tons, 4 to 8-inch class 150, Orange, Calif., for Main street improvement, to Drainage Construction Co., Los Angeles.
350 tons, cement-lined cast pipe for Providence, R. I., to United States Pipe & Foundry Co., East Burlington, N. J.
164 tons, 6 to 10-inch class B, sewer in Summerland avenue, Los Angeles, to unstated interest.
150 tons, various sizes cast pipe for Lynn, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.
100 tons, 6 to 20-inch cast pipe for Southboro, Mass., to R. D. Wood & Co., Florence, N. J.
Unstated tonnage, 6500 feet, various sizes, bell and spigot pipe for San Juan, to C. R. Rossi, Porto Rico.
Unstated tonnage, 4300 feet, various sizes of cast pipe for Panama, to United States Cast Iron Pipe Co., East Burlington, N. J.; fittings to American Cast Iron Pipe Co., Birmingham, Ala.

STEEL PIPE AWARDS

10,000 tons, electric welded pipe for Missouri-Kansas-Texas Pipe Line Co. to Republic Steel Corp., Youngstown, O., making its portion 20,000 tons of large order, of which 150,000 to 200,000 tons went to National Tube Co. as noted in IRON TRADE REVIEW of May 1, and in which also Youngstown Sheet & Tube Co., Youngstown, shared.

CONTRACTS PENDING

1700 tons, large diameter cast iron or welded steel pipe for Wisconsin Rapids, Wis.
831 tons,8 and 12-inch class B or 150, Fullerton, Calif.; bids opened.
300 tons, 30 and 48-inch cast pipe for New Haven, Conn.
200 to 500 tons, 4 to 16-inch cast pipe for Chicago; Glamorgan Pipe & Foundry Co. low at $47.70, delivered, for the 4-inch, and $44.70 for the 16-inch.
153 tons, 6 and 8-inch class B, improvement Sixty-seventh street, Long Beach, Calif.; bids opened.
115 tons, 10 to 12-inch cast pipe for Lowell, Mass.

STEEL PIPE PENDING

Unstated tonnage, 6000 feet steel pipe, small sizes, for United States Marine Corp; Virginia Machinery & Well Co. low bidder.

Tin Plate

Reduction in 1930 Output Estimates At 10 Per Cent

TIN PLATE PRICES, PAGE 74

Pittsburgh, June 24.—Tin plate operations and specifications are steady while shipments continue ahead of the May volume. Specifications are being received for August shipment and are in fair volume. Crop reports of an unfavorable nature still are lacking, and with tin plate requirements for general line cans showing only a slight decrease from the tonnage a year ago prospects point to a favorable outlook for the remainder of the year. Early estimates point to a 1930 tin plate production of around 10 per cent less than in 1929. Tin plate continues $5.25, Pittsburgh, per base box.

Reline Carnegie Stacks

Pittsburgh, June 24.—Improvement to plants of the Carnegie Steel Co. in this district will be carried out during the next several months at an estimated cost of about $5,000,000. Blast furnace relinings at Mingo Junction, O., Rankin and Braddock, Pa., will constitute a major portion of the expenditure. Cranes and ladles are expected to be purchased for Rankin.

Sheets

Outlook Is for Quiet July—Valley Mills Increase Operations Temporarily—Prices Weak

SHEET business as reflected by current operating rates is fairly steady. Mills in the Mahoning valley have increased their average from below 40 per cent a week ago to over 53 per cent. Some large eastern consumers are covering requirements for third quarter. July specifications at Detroit are the lighest of any month so far this year. Prices exhibit an easy tendency.

SHEET PRICES, PAGE 73

Pittsburgh, June 24.—Sheets continue in a quiet market. Incoming business is fairly steady in contrast to the declining trend during the preceding several weeks. Producers look for a fairly steady demand in the near future, although further reduction is expected in automotive tonnage during July. Operations remain at 50 to 55 per cent. Mills specializing in automotive sheets are at a lower rate. Steel furniture manufacturers are smaller buyers than during their active first quarter. Farm implement builders are in their quiet season. Although occasional concessions are noted on some grades quotations are unchanged. Black sheets generally are 2.55c, galvanized 3.20c, blue annealed sheets 2.15c, and blue annealed plates 2.00c.

New York, June 24.—Some of the largest sheet consumers who heretofore this year have been buying on a hand-to-mouth basis are covering their requirements for the next three months. Prices of galvanized and black sheets are at the lowest point since 1915 and 1916, respectively. Galvanized sheets appear firm at 3.20c, Pittsburgh, on tonnage for the manufacturing trade, and 3.10c to 3.15c, to jobbers. Black sheets are holding at 2.55c to the manufacturing trade, with concessions of $1 a ton to some of the large jobbers. Blue annealed plates and blue annealed sheets continue 2.00c and 2.15c, respectively.

Cleveland, June 24.—Sheet producers note further recession in specifications and orders. A number of inquiries are current for various grades including autobody. One of the largest comes from three or four sources for Ford running board stock. Several thousand tons are wanted. Autobody sheets are 3.60c, Pittsburgh, subject to change without notice. Makers will accept business for delivery until September. Black sheets are 2.45c to 2.55c; galvanized, 3.15c to 3.20c and metal furniture, 3.70c to 3.80c. No. 13 blue annealed sheets are 2.15c, although continuous mills have quoted 25 cents a ton less.

Youngstown, O., June 24.—A slight increase is noted in sheetmaking preceding the usual summer shutdown of leading consumers. Principal among these are the automotive interests and partsmakers, whose inventories appear to be extremely low. Third quarter requirements of partsmakers are not being considered at this time. Demand by steel furniture and barrel makers is spotty. Accumulation of small orders allowed two Niles sheet mills to resume on Monday. Other plants started Tuesday. Although 3.70c is the general quotations on autobody sheets it is admitted 3.60c might be done for quick shipment. Blue annealed are 2.00c and 2.15c. The usual quotation on galvanized is 3.20c.

Philadelphia, June 24.—Sheet demand is featured by placing of some fair tonnages including one lot of 300 tons of black sheets. The volume of business is smaller than a week ago. Blue annealed continue firm at 2.00c and 2.15c, base, Pittsburgh, for heavy and light gages, respectively. Strip sheets generally sell at about $4 a ton lower. Black sheets continue 2.55c, base, Pittsburgh, with occasional concessions on desirable tonnage. Galvanized sheets usually are 3.15c, base, Pittsburgh, subject to concessions.

Cincinnati, June 24.—New sheet orders have increased, compared to the preceding week. Specifications from radio manufacturers have improved. Production schedules are being held at 40 to 50 per cent.

Detroit, June 24.—Sheet specifications for July shipments are the lightest for any month this year. With Ford to be down two weeks, Chevrolet down to a 3-day week, Hudson planning a shutdown and most makers other than Buick and Chrysler on lighter schedules, consumption is not encouraging to the mills. Consumers have minimum inventories. Autobody sheets are 3.60c, base Pittsburgh, with full extras not always asked. Black sheets are in an indeterminate market. For some users 2.45c to 2.50c, Pittsburgh, might be regarded as the market, but less has been done.

Chicago, June 24.—Sheet mills in this district are booking business at the rate of the last several weeks. Operations this week are about 50 per cent, compared with 60 to 65 per cent a week ago. Fairly encouraging prospects are seen for buying of galvanized products by jobbers for the roofing trade in a short time. Mill prices are unchanged at 2.65c for No. 24 black; 3.30c for No. 24 galvanized, and 2.10c to 2.20c for No. 10 blue annealed.

St. Louis, June 24.—Sheet producers report further recession in new business and specifications. Demand from the automotive industry is far below expectations. Galvanized material is moving slowly. Purchasing by jobbers is at a standstill.

Structural Shapes

East Is Center of Activity—Large Individual Projects More Numerous — 6500-ton Bank Let in St. Paul, 6000-Ton Job in East

PENDING work contains so many large individual tonnages, fabricators are greatly encouraged over the outlook. Most of these are located in New York, where awards have been heavy for several weeks. Included are three engineering projects taking 111,000 tons—two elevated highways 48,000 and 43,000 tons, respectively, and two subways, 20,000 tons. Several commercial structures are up requiring 10,000 tons apiece. A school of that size is pending in Brooklyn. Another pier, 3550 tons, is bid upon at Weehawken, N. J. In addition to several awards in New York in the 2000-6000-ton range, a bank was awarded in St. Paul, 6500 tons. Buildings for Wisconsin Steel Co., taking 1926 tons, were awarded, as was a 2000-ton store and office building in New York.

STRUCTURAL SHAPE PRICES, PAGE 73

New York, June 24.—Pending shape tonnage continues to mount, although awards have been heavy the past six weeks. Three engineering projects, to take approximately 111,000 tons, include an elevated highway over New Jersey meadows, 48,000 tons, two sections of the west side elevated highway 43,000 tons, and 20,000 tons for subways. Bids on the latter will open June 27 and 30. Another Erie pier at Weehawken, N. J., calls for 3500 tons. In addition to heavy engineering work, commercial building also is on the increase. Several such projects will take close to 10,000 tons each.

Prices continue easy, but somewhat steadier. A promising gain in small awards is noted. As a result most small fabricators are busier. Larger shops as a rule have good order books.

Boston, June 24.—Less than 1000 tons of structural shapes was placed in this section las week. One job, 800 tons for a high school at Newton, Mass., went to New England Structural Co.

Philadelphia, June 24.—Shape demand in the East so far in June reflects improvement up to 20 per cent as compared with the same part of May. Eastern mills operate around 80 per cent and the outlook in the structural market is good. Prices are easy and the usual figure on plain standard material is 1.70c, base, eastern mill.

Pittsburgh, June 24.—Structural shape awards are light but inquiry is slightly more active. Operations of fabricators are fairly well maintained. Small lots predominate in new buying. Specifications for plain material are in steady volume with the market on new business generally 1.70c, Pittsburgh.

Buffalo, June 24.—Demand for structural steel continues one of the bright spots in the present market. A steady flow of shapes by lake to Middle Western points is taking place from this district's steelworks.

Cleveland, June 24.—The local structural market remains quiet, although bids are in on the board of education headquarters building taking about 1300 tons. Crowell & Little Construction Co. is low bidder, with Hunkin-Conkey Construction Co. low on an alternate design. Bids close July 3 on the lake front stadium, estimated to take 4200 tons. Plain material is 1.70c, Pittsburgh.

Chicago, June 24.—Retrenchment by railroads is resulting in some holdups of promised structural tonnage. An inquiry for a small tonnage for the Milwaukee railroad has appeared, and Chicago & North Western has about 3600 tons pending. It is reported in this market that Ford Motor Co. has 3000 to 4000 tons of channels on inquiry for extensions. Structural mill specifications permit a 65 to 70 per cent operating schedule. Shipments are prompt to three weeks, depending upon rolling cycles.

Birmingham, Ala., June 24.—Contracts taking more than 100 tons of shapes at a time lag. A number o inquiries have been received, however, and fabricators hope that renewed activity is near. Southern Steel Works is erecting a 600-ton extension to the monocast shed for American Cast Iron Pipe Co., previously reported.

CONTRACTS PLACED

6500 tons, First National Bank building, St. Paul, to Bethlehem Steel Co., Bethlehem, Pa.

6000 tons, gymnasium and swimming pool Yale university, New Haven, Conn., to Levering & Garrigues Co., New York; Marc Eidlitz & Son, New York, general contractors.

3000 tons, building, Royal Insurance Co., William street, New York, to Taylor-Fichter Steel Construction Co., New York; Marc Eidlitz & Son, New York, general contractors.

2000 tons, stores and office building, 608 Fifth avenue building, Fifth avenue and Forty-ninth street, New York, to Post & McCord Inc., New York; E. H. Faile & Co., contracting engineers.

1926 tons, open-hearth building, soaking pit and blooming mill, Wisconsin Steel Co., South Chicago, Ill., to McClintic-Marshall Co.

1700 tons, Burton building, Des Moines, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines.

1500 tons, apartment, Fifth avenue and Sixty-seventh street, New York, to unstated fabricator.

1250 tons, bridge, Seaboard Air Line, Appomattox river, Petersburg, Va., to American Bridge Co.

1200 tons, apartment, Third avenue and Sixteenth street, New York, to Easton Structural Steel Co., Easton, Pa.

1080 tons, building Electro Metallurgical Co., Boncar, W. Va., to McClintic-Marshall Co.

1000 tons, Illinois bridge work, to Mississippi Valley Structural Steel Co., Decatur, Ill., and Clinton Bridge Works, Clinton, Iowa.

1000 tons, miscellaneous shapes and plates for penstock, A. O. Smith Corp., Milwaukee, to Chicago Bridge & Iron Works, Chicago.

990 tons, Loew's theater, Astoria, Long Island, N. Y., to American Bridge Co.

918 tons, water tower and tank, city of Detroit, to McClintic-Marshall Co.

800 tons, high school, Newton, Mass., to New England Structural Co., Boston.

700 tons, Myron Taylor hall, Cornell university, Ithaca, N. Y., to American Bridge Co.

615 tons, state bridge over Salinas river near Bradley, Cal., to United States Steel Products Co.

583 tons, building, Tomsig Realty Co. Perth Amboy, N. J., to Hinkle Iron Co., New York.

500 tons, war memorial, Trenton, N. J., to American Bridge Co., through Newton A. K. Bugbee, Trenton, general contractor.

500 tons, 325 tons of shapes, the remainder, columns, building at 1549 Lee road Cleveland Heights, O., for Abeyton Realty Co., Cleveland; to Paterson-Leitch Co., Cleveland; Andrew J. Thomas, 2 West Forty-sixth street, New York, architect.

500 tons, chemical plant for Shell Oil Co., Bay Point, Calif., to Judson-Pacific Co., San Francisco.

500 tons, 14-story extension on East Sixty-fourth street, to apartment at 834 Fifth avenue, New York, to Paterson Bridge Co., Paterson, N. J.; Anthony Compagna, builder.

480 tons, apartment, 21 West Sixty-seventh street, New York, to Harris Structural Steel Co., New York; Gromenberg & Leuchtag, New York, architects.

350 tons, dormitory, White Plains, N. Y., to Hinkle Iron Co., New York.

323 tons, oven steel work, Koppers Construction Co. West Farms, N. Y., to McClintic-Marshall Co.

314 tons, bridges, Southern railway, Baltimore, to Mt. Vernon Bridge Co., Mt. Vernon, O.

300 tons, bridge, Pennsylvania railroad, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, industrial building, Washington, Cedar and Albany streets, New York, to Levering & Garrigues Co., New York; Industrial Engineering Co., New York, general contractor.

300 tons, four story building, Christian Brothers institute 164th street and Walton avenue, Bronx, N. Y., to unstated fabricator; Thomas J. Waters Co., general contractor.

300 tons, apartment, Camac and Lindley streets, Philadelphia, to Kalman Steel Co. Inc., Chicago.

300 tons, buildings for International Nickel Co., Bayonne, N. J., to the Austin Co., Cleve-

Awards Compared

	Tons
Awards this week	41,304
Awards last week	34,413
Awards two weeks ago	30,992
Awards this week in 1929	27,378
Average weekly awards, 1930	34,658
Average weekly awards, 1929	42,213
Average weekly awards, May	48,522
Total awards to date, 1929	1,113,503
Total awards to date, 1930	901,098

land.
300 tons, 6-story garage, East Fifty-six street, New York, to Hay Foundry & Iron Works, New York; Kendansky & Levy, New York, general contractors.
265 tons, Zuehlke commercial block, Appleton, Wis., to Lakeside Bridge & Steel Co., Milwaukee.
250 tons bridge, New York Central railroad, Richards, O., to Bethlehem Steel Co., Bethlehem, Pa.
250 tons, high school, Greensburgh, N. Y., to Guibert Steel Co., Pittsburgh.
235 tons, oven steel work, Koppers Construction Co. Troy, N. Y., to McClintic-Marshall Co.
225 tons, log skidder, Weyerhauser Timber Co., Tacoma, Wash. to Lidgerwood-Pacific Co., Tacoma.
205 tons, bridges in Virginia for Virginian railway, to American Bridge Co.
200 tons, post office, Passaic, N. J., to Breen Iron Works, Newark, N. J.; Agostini Bros., general contractors.
180 tons, high school, Mineola, Long Island, N. Y., to Buckingham Steel Co., Brooklyn, N. Y.
170 tons, addition to Polytechnical preparatory school, Brooklyn, N. Y., to George A. Just Co., Long Island City N. Y., through William Kennedy Construction Co., Brooklyn, general contractor.
166 tons, bridge in Clackamas county, Oreg., to Virginia Bridge & Iron Co., Roanoke, Va.; general contract to Lindstrom & Feigenson, Portland, Oreg., as noted last week.
165 tons, apartment, California and Joyce streets, San Francisco, to McClintic-Marshall Co.
165 tons, apartment, Clay and Franklin streets, San Francisco, to McClintic-Marshall Co.
150 tons, bank building, Meadville, Pa., to Guibert Steel Co., Pittsburgh.
150 tons, school, Frontenac, Summerdale and Benner streets, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.
150 tons, St. Ann's Catholic church, Lancaster, Pa., to Bauman Iron Works, Reading, Pa.
150 tons, dormitories, State Teachers college, Trenton, N. J., to Richard de Con Co., Philadelphia.
140 tons, store, San Jose Hardware Co., San Jose, Calif., to McClintic-Marshall Co.
135 tons, hotel addition, Riverside, Calif., to Modern Iron Works, Los Angeles.
135 tons, state crossing in Nevada county, Calif., to United States Steel Products Co.
125 tons, dormitory and classroom addition, St. Mary's seminary, Baltimore, to Maryland Steel Products Co., Baltimore, through M. A. Long Co., Baltimore, general contractor.
120 tons, post office, Racine, Wis., to Lakeside Bridge & Steel Co., Milwaukee.
110 tons, factory addition, Garton Toy Co., Sheboygan, Wis., to Lakeside Bridge & Steel Co., Milwaukee.
100 tons or more, high school, Hastings, Mich., to Jarvis Engineering Works, Lansing, Mich.
100 tons or more, Heronville school, Oklahoma City, Okla., to Capitol Steel & Iron Works Co., Oklahoma City.
100 tons, Sweet's ballroom, Oakland, Calif., to Pacific Coast Engineering Co., Oakland, Calif.
100 tons, district court house, East Boston, Mass., to New England Structural Co., Boston.

CONTRACTS PENDING

48,000 tons, estimated, elevated highway over New Jersey meadows; this will connect with approaches to Hudson river bridge.
43,000 tons, revised estimates for two sections, west side elevated highway, New York, from Twenty-second to Seventy-ninth streets, the third section to pass over New York Central tracks, bids on which are expected to be taken shortly.
14 820 tons, subway route 108, section 8, New York.
10,000 tons, technical high school, Brooklyn, N. Y.
6000 tons, units 2 and 3, state line central station, Hammond, Ind.
5000 tons, apartment house, Fifty-second street and East river, New York.
4350 tons, subway 106, section 7, New York.
4200 tons, civic stadium, lake front, Cleveland; bids asked by July 3; Osborn Engineering Co. engineer.
4000 tons, Louis Dinkler hotel, Atlanta, Ga.
3500 tons, pier D, Erie railroad, Weehawken, N. J.; steel for one Erie pier placed last week and announced in IRON TRADE REVIEW, going to Truscon Steel Co.
2050 tons, Astor apartments, 120 East End avenue, New York.
1600 tons, Trenton channel bridge, Trenton, Mich. for Wayne county road commissioners.
1600 tons, building Southern New England Telephone Co., Hartford, Conn., revised from 1200 tons.
1470 tons, administration building, board of education, Philadelphia; bids in.
1300 tons, headquarters building, board of education, Cleveland; Crowell & Little Construction Co., low bidder; Hunkin-Conkey Construction Co., low on alternate.
1200 tons, Shaker Heights, O., high school; bids close late in July.
1050 tons, New York approach, Hudson River bridge; bids being taken by Port Authority of New York.
1000 tons, building, Western Union Telegraph Co. Boston.
1000 tons, three buildings, St. Joseph's hospital, Flint, Mich.
1000 tons, passenger building, Cincinnati Union Terminal Co., Cincinnati.
900 tons, highway bridges, New York, in addition to about 1000 tons previously announced.
830 tons, grade elimination and track elevation, Kentucky & Indiana Terminal Railroad Co., Louisville, Ky.
800 tons, three buildings, Southern Mineral Products Co., on Piney river, Virginia; Stone & Webster Inc., New York, engineer.
800 tons, storage tanks, at Long Beach, Calif., for Procter & Gamble Co., Cincinnati.
600 tons, skimmer walls, Arundel Corp., Safe Harbor, Pa.
600 to 700 tons, highway bridges, New York state; bids in June 24.
600 tons, Federal Reserve bank, Richmond, Va.
565 tons, dormitory, Drexel institute, Philadelphia.
545 tons, paint shop, American Car & Foundry Co., St. Louis.
500 tons, bridge, New York Central, South Bend, Ind.
500 tons, mail building, Chicago.
500 tons, bridge work for Chicago, Milwaukee, St. Paul & Pacific railroad.
500 tons, state highway bridges at Bradley, Calif.
500 tons, state highway bridges at Salinas, Calif.
500 tons, store building for S. S. Kresge & Co., Spokane.
500 tons, Warner Bros. theater Ridgewood, Queens, N. Y.
400 tons, bridges, Pittsburgh & West Virginia railroad, Connellsville, Pa.
400 tons, apartment house, Bryn Mawr, Pa.; Shubert Construction Co., Philadelphia, builder.
400 tons, building, Northwestern Bell Telephone Co. Cedar Rapids, Iowa.
400 tons, extension to Long Beach, Calif. plant, Ford Motor Co., Detroit.
350 tons, Friars club, Cincinnati.
300 tons, Faxton hospital, Utica, N. Y.
250 tons, steam generator building, Granite City Steel Co. Granite City, Ill.
210 tons, Center avenue bridge, Merrill, Wis.; Stevens Bros., St. Paul, low bidder on general contract at $139,847; Wausau Iron Works, Wausau, Wis., second low at $142,160.
200 tons, auxiliary steam plant for Tacoma, Wash.; bids June 23.
200 tons, Manhattan approach to Queensboro, N. Y., bridge; bids being taken by department of plants and structures, New York.

Concrete Bars

2000-ton Dam Awarded—East Develops More Inquiries—Tonnage Prices Weak

TOPPED by a 2000-ton dam at Safe Harbor, Pa., awards remain active but the weekly average for June is about 1200 tons below the May weekly average. Inquiries are active, particularly in the East, where bridges, piers, subways, etc., continue to account for large individual lots. A post-office foundation at Boston will require 1100 tons, a New York bridge 1000 tons.

REINFORCING BAR PRICES, PAGE 73

New York, June 24.—Pending volume in concrete reinforcing bars is moderately heavy. Piers, bridges and subway work lead. Two subway sections will be opened for general bids June 27 and 30. The New York approach to the Hudson river bridge will take more than 1000 tons. Prices on attractive tonnages continue weak, although on smaller lots they are firmer. Demand for road mesh is holding up well. Connecticut will open bids July 7 on five contracts calling for a heavy tonnage of bars.

Boston, June 24.—Conditions in concrete bars showed little change the past week. Probably 200 tons was disposed of in 10 to 25-ton lots. One of the best projects to come forward in months is the foundation for the new post office, estimated at 1100 to 2000 tons. Bids are to be in today.

Owing to the readjustment in freight rates prices for concrete bars have been advanced. For 1 to 5-ton lots 3.150c now rules; 5 to 99 tons, 2.650c and for 100 tons and more 2.550c.

Pittsburgh, June 24.—Concrete bar business has moderated recently and incoming tonnage is falling below the active May rate. Placing of 2000 tons for a power dam near Columbia, Pa., is outstanding among recent awards.

Buffalo, June 24.—A large number of small orders is being placed for reinforcing bars. Large tonnages are lacking in present coverage. Some good sized tonnages are being figured from specifications now being drawn but exact amounts cannot be given at present. Prices are severely competitive.

Cleveland, June 24.—The 1000-ton lot of concrete bars for piers for Central-Lorain bridge here, will probably be placed before the week is out. Letting was held up by Lowenstein

Awards Compared

	Tons
Awardsthis week	6,162
Awards last week	10,525
Awards two weeks ago	8,965
Awards this week in 1929	7,774
Average weekly awards, 1929	5,849
Average weekly awards, 1930	7,142
Average weekly awards, May	8,227
Total awards to date, 1929	168,627
Total awards to date, 1930	185,681

Construction Co., general contractor, to admit another bidder. The 480-ton order to Paterson-Leitch Co. for General Electric Co. warehouse, Woodland avenue, already has been expanded to about 800 tons and may grow larger as the work progresses. The next large contract to come up will be the lake front stadium, structural steel for which now is being figured. Billet rolled bars usually are 1.70c, Pittsburgh, or Cleveland, but around 1.65c, Cleveland, has been done on attractive tonnages. Most awards are in the 25 to 50-ton cass.

Chicago, June 24.—With a fair volume of small-tonnage inquiries, more than 1000 tons in larger projects have appeared in the reinforcing bar market. Plans for the Henrotin hospital in Chicago call for about 700 tons of bars. An addition to the plant of the State Line Generating Co., in the Calumet industrial district, includes 400 tons for the substructure. More Wisconsin and Indiana road work is pending. Rail steel bars are 1.65c to 1.70c.

CONTRACTS PLACED

2000 tons, dam, Arundel Corp., Safe Harbor, Pa., reported placed with Kalman Steel Co. Inc., Chicago.
500 tons, Illinois road work, to Calumet Steel Co., Chicago.
500 tons, approximate, storage terminal foundations, Standard Oil Co., Bayonne, N. J., to Concrete Steel Co., New York; Raymond Concrete Pile Co., general contractor.
415 tons, Saw Mill river parkway, Westchester county, New York, to Concrete Steel Co., New York; Banco Co., general contractor.
400 tons, Panama Canal zone requirements, to Jones & Laughlin Steel Corp., Pittsburgh.
350 tons, state bridge over Salinas river at Bradley, Calif., to unstated interest.
320 tons, additional warehouse, General Electric Co., Cleveland, original order for 480 tons to Paterson-Leitch Co., increased to 800 tons; Sam W. Emerson Co., Cleveland, general contractor.
300 tons, Illinois road work, to Truscon Steel Co., Youngstown, O.
200 tons Hall of Justice, Pasadena, Calif., to Blue Diamond Co., Los Angeles.
200 tons, Illinois road work, to Olney J. Dean Co., Chicago.
150 tons, Illinois road work, to Concrete Engineering Co., Chicago.
130 tons, civic opera studio and warehouse, Chicago, to Calumet Steel Co., Chicago; previously reported to unstated fabricator.
130 tons, bridge over Yakima river, Prosser, Wash., to Pacific Coast Steel Co., Seattle, through McRae Bros., Seattle general contractors.
128 tons, state paving in Santa Clara county, Calif., for State to unstated interest.
125 tons, Grover Cleveland high school, Brooklyn, N. Y., to Carroll-McCreery Co. Inc., New York; George F. Driscoll Co., general contractor.
110 tons, Marek building, 80 Broad street, New York, to Carroll-McCreery Co. Inc., New York; Spencer, White & Prentice, general contractors.
104 tons, addition, Lincoln high school, Seattle, to Pacific Coast Steel Co., Seattle.
100 tons, dormitory and classroom addition, St. Mary's seminary, Baltimore, to Penn Steel Service Co., Baltimore, through M. A. Long Co., Baltimore, general contractor.

CONTRACTS PENDING

1000 tons, New York approach, Hudson river bridge, New York.
700 tons, Henrotin hospital, Oak and La Salle

(*Concluded on Page* 90)

Rails, Cars

Car Buying Is Delayed—Awards All Small—350 Ore Cars Up—40,000-ton Rail Order Divided

RETRENCHING policies of railroads, particularly at Chicago, causes postponement of closing on at least three car inquiries. Present placements confined to 3, 4 and 6 cars at a time. Anglo Chilean Consolidated Nitrate Corp. has 350 ore cars pending, and Aluminum Co. of America wants 25 hoppers. Norfolk & Western bought 40,000 tons of rails. Locomotives are quiet.

RAILROAD TRACK PRICES, PAGE 74

Chicago, June 24.—Rail mills are operating 65 per cent. Miscellaneous rail orders last week totaled less than 1000 tons, while 1000 to 1500 tons of track fastenings were sold. The outlook for railroad track buying in the autumn months is fairly encouraging as much of the rail tonnage ordered out has not been laid, and it is indicated a pick-up in railroad freight traffic would result in present material being laid and secondary commitments placed.

It is understood that purchase of 2300 freight and passenger cars for Illinois Central is virtually postponed for about 30 days. Minneapolis & St. Louis has definitely postponed its inquiry for 500 freight cars, and Pacific Express will not build its 1500 refrigerator cars for some time.

New York, June 24.—Dullness continues in the car market. Fresh inquiry is light and orders are scattered. Locomotive demand is as dull as at any time in several months.

Quarterly contracts for track accessories and supplies are being generally extended, as improvement programs involving these materials have been going forward slowly.

Pittsburgh, June 24.—Relaying rails and light rails are easier. The former are off $1 at $24 to $29, for 60 to 90-pound material, while the average price on light rails is $2 a ton lower at $34. The latter had been subjected to considerable pressure for some time as the result of competition with the rerolling material. Demand for both grades continues dull. Railroads are asking bids on third quarter requirements of various steel products but inquiry otherwise is dull. Carnegie Steel Co. took 30,000 tons of the Norfolk & Western railroad award of 40,000 tons of rails.

CAR ORDERS PLACED

Boston & Maine, four dining cars, to Pullman Car & Mfg. Corp., Chicago.
Erie, six coaches, three dining cars going to Pullman Car & Mfg. Corp., Chicago, and three combination mail and express cars, to American Car & Foundry Co., New York.

RAIL ORDERS PLACED

Norfolk & Western, 40,000 tons of rails: 30,000 tons to Carnegie Steel Co., Pittsburgh, and 10,000 tons, to Bethlehem Steel Co., Bethlehem, Pa.

CAR ORDERS PENDING

Aluminum Co. of America, 25 70-ton hopper cars.
Anglo-Chilean Consolidated Nitrate Corp., 350 30-ton steel ore cars.
Central of Georgia, two baggage and express cars and one baggage and mail car.
Erie, two mail and express cars.
Maine Central, five passenger cars, and two combination passenger and baggage cars.

Sales, Output of Sheets Reduced in May

Daily average sheet sales reported by independent mills decreased to 6600 tons in May from 10,003 tons in April. The May rate was lowest since last November. Production dropped to 8846 tons and shipments fell to 8595 tons. The National Association of Flat Rolled Steel Manufacturers' complete report for May follows:

	Net Tons	Per cent of Capacity
Total sales for May	204,589	54.7
Total production	274,220	73.3
Total shipments	266,436	71.2
Unfilled tonnage June 1	461,756	123.4
Approximate finished stock on on hand awaiting shipments	119,117	31.8
Approximate in stock, unsold..	85,585	22.9

The total sheet capacity of the United States for the month of May, 1930, was approximately 553,800 net tons. The capacity on which the above figures are based is 374,300 net tons.

A comparison of total monthly sales, production and shipments follows:

	Sales	Production	Shipments
May, 1929	279,783	393,430	392,336
June	307,911	337,841	347,989
July	337,222	323,905	344,676
August	282,107	366,734	365,649
September	274,568	302,490	301,330
October	258,810	319,660	291,135
November	134,391	204,071	207,200
December	234,599	181,916	178,575
January, 1930	382,122	291,529	241,677
February	203,315	275,952	241,441
March	299,764	259,658	275,235
April	300,086	308,988	291,601
May	204,589	274,220	266,436

Daily averages follow:

	Sales	Production	Shipments
May, 1929	9,025	12,691	12,656
June	10,264	11,261	11,560
July	10,878	10,448	11,118
August	9,100	11,518	11,795
September	9,152	10,083	10,046
October	8,349	10,312	9,391
November	4,480	6,802	6,907
December	7,568	5,868	5,760
January, 1930	12,326	9,404	7,796
February	7,011	9,516	8,326
March	9,669	8,376	8,878
April	10,003	10,299	9,720
May	6,600	8,846	8,595

Strip

Smaller Demand as Automotive Buying Shrinks—Prices Down $1 on Hot-Rolled Product

WITH automotive requirements small and indications for further recession makers of strip steel find their market narrowed. A revision of prices downward brings quotations $1 per ton below the previous mark, although shading had forecast this level. Users refuse to take an interest in third quarter tonnage. Production continues to decline under smaller bookings.

STRIP PRICES, PAGE 74

Pittsburgh, June 24.—Strip steel demand has declined further with additional curtailment in automotive tonnage. Automotive requirements for July give indications of a further marked decrease. Prices have eased moderately and new contracting generally is on the basis of 1.75c and 1.65c, Pittsburgh, for the two sizes of hot strip and 2.45c for cold-rolled strip. This represents a reduction of $1 a ton on hot strip, although 2.45c had been generally the market on cold-rolled material. Mill operations continue to decline, averaging 55 to 60 per cent for hot strip and 25 to 30 per cent for cold-rolled mills.

New York, June 24.—Cold-rolled strip is holding at 2.45c to 2.55c, with the inside figure more representative of the going market. Trading is as dull as at any time this year. Hot-rolled strip is unchanged at 1.70c to 1.80c, Pittsburgh, for wide and 1.80c to 1.90c for narrow.

Worcester, Mass., June 24.—Though May held to the rate of production established in April and March, cold-rolled strip steel fell off this month despite good demand from New England and the west coast. Cold-rolled strip is quoted at 2.60c to 2.70c but there has been some shading.

Cleveland, June 24.—The strip steel market shows no improvement, owing to an absence of improvement in automotive demand. Producers look forward to dull July and a duller August. No interest can be stirred up over third quarter and contracting for that period is negligible. Cold-strip usually is 2.45c, Cleveland. Small quantities are held at 2.55c. Hot-strip demands are confined to early needs in limited quantities. Wide is 1.65c to 1.70c, Pittsburgh, and narrow $2 more.

Chicago, June 24.—Efforts are being made by producers of hot-rolled strip to stabilize the market for third quarter on the basis of 1.80c to 1.90c, Chicago. The market recently has been definitely lower. Quotations for attractive tonnages have been 1.75c for 6 to 24-inch widths, while in narrow widths heavier tonnages have brought out offers of 1.80c, Chicago. Hot-rolled mills are operating at about 50 per cent, a slight decline. Orders have been slipping for cold-rolled strip steel. Attractive tonnages develop 2.45c, Pittsburgh-Cleveland. While a fair amount of Ford and Chevrolet business is being released, orders from the miscellaneous manufacturing industries, while light, help to balance order books.

Philadelphia, June 24.—Hot strip continues easy, usually 1.70c, Pittsburgh, for 6 to 24-inch widths and 1.80c for widths up to six inches but concessions are allowed on especially desirable tonnages. Cold strip continues 2.45c, Pittsburgh. There is less disposition to specify against sheet and strip contracts and more disposition to buy specific tonnages. In this way buyers are getting lower prices than if they specified against contracts.

Cold Finished Steel

Advancing Summer Slackens Demand —Third Quarter Needs Quiet

COLD FINISHED PRICES, PAGE 74

Cleveland, June 24.—Cold-finished bar specifications are few. The automotive industry is consuming less material as summer advances. Other buying is hand-to-mouth. Third quarter contracting is nil. The 2.10c, Cleveland, price is named.

Pittsburgh, June 24.—What change is noted in demand for cold-finished bars is downward. Total activity, however, is only moderately below that of May with most of the slackening coming from lighter automotive requirements. Further decrease is in prospect for July. Third quarter contracting generally is on the basis of 2.10c.

Wire

Smaller Volume of Buying and Shipments Mark Wire Market—Automotive Needs Less

USERS of wire and wire products are taking smaller tonnage and the market has contracted further. Some shading is met in nails, which continue to lag. Tonnage and shipments are below those of May and production shows no improvement. Contracting for third quarter lacks spirit. Jobbers are taking little material as their stocks are moving slowly. Prices are unchanged.

WIRE PRICES, PAGE 74

Chicago, June 24.—Several buyers of manufacturers' wire are ordering out slightly more tonnage. Other buyers have reduced and the average remains about the same. Jobber and dealer shipment of common wire products have dropped. Operations of western wire mills continue at 50 per cent. Despite offers of lower prices for more attractive business, quotations are on the basis of 2.35c, Chicago or western mills, for bright plain wire. Annealed fence wire continues at 2.35c to 2.45c, while galvanized barbed wire is unchanged at 2.85c to 2.95c.

Worcester, Mass., June 24.—Wire production is lessening with slackening in demand from automobile accesory and building sources. June is showing a drop in shipments from preceding months this year and a decided decrease from last year. Plain bright wire to dealers is 2.40c, base, Worcester.

Pittsburgh, June 24.—Wire demand was lighter during the past week and incoming tonnage and shipments are off moderately from May. Nails remain dull, with the decline in general industrial operations adversely affecting manufacturers' wire. Third quarter contracting is slow. Producers continue to name $2.15 to $2.25 for standard wire nails and 2.30c for bright plain wire. Reports of $2.10 on wire nails, however, are becoming more common.

New York, June 24.—Nails generally are moving at $2.15, Pittsburgh, with occasional shading of 5 cents. Plain wire is firm at 2.30c, Pittsburgh. Demand is light.

Cleveland, June 24.—Wire producers feel effects of curtailments in the automotive industry both directly and indirectly. Wire spring makers for automobile upholstery are increasingly quiet; nut, bolt and screw manufacturers ordinarily taking large quantities of wire and wire rods for automotive uses are holding up material and withholding specifications. The jobber trade also is dull. Prices seem fairly well observed although admittedly the market is untested. Wire nails are $2.15, Cleveland, and plain wire, 2.30c.

Philadelphia, June 24.—Plain wire continues firm at 2.30c, Pittsburgh, but nails are weak at sales from $2.10 to $2.15, Pittsburgh.

Nonferrous Metals

Copper More Stable Following Recovery from Lowest Prices Since 1921—Most Other Metal Quotations Continue to Drop

Prices of the Week, Cents a Pound

	Copper			Straits Tin		Lead	Lead East	Zinc	98-99%	Spot	Ingot
	Electro delivered	Lake delivered	Casting refinery	New York Spot	Futures	New York	St. Louis	St. Louis	Aluminum	Antimony	Nickel
June 18	11.50	12.07½	11.50	29.75	30.17½	5.40	5.30	4.40	23.90	7.10	35.00
June 19	12.00	12.07½	11.75	31.00	31.40	5.40	5.30	4.37½	23.90	7.05	35.00
June 20	12.00	12.07½	11.80	30.50	30.90	5.40	5.30	4.35	23.90	7.00	35.00
June 21	12.00	12.07½	11.80	.....	.....	5.40	5.30	4.35	23.90	7.00	35.00
June 23	12.00	12.07½	11.80	29.67½	30.12½	5.25	5 15	4.30	23.90	7.00	35.00
June 24	12.00	12.07½	11.80	30.70	31.10	5.25	5.15	4.30	23.90	7.00	35.00

NEW YORK, June 24.—Cutting of prices has become almost a daily occurrence in the metal market. Copper has been more stable in the past week with a recovery from the lowest price since 1921, but lead and zinc have continued downward. The tin market experienced a short recovery in which buyers remained skeptical so that the price quickly fell back to its previous level.

Copper—Custom smelters have sold metal down to 11.50c, Connecticut, while other producers have stopped at 12.00c. The low figure was so obviously a bargain that a number of consumers indicated they would take large quantities, but the market at 11.50c was made on a narrow tonnage, so that prices snapped back quickly to 12.00c without consumers getting their bargains in large amounts. At the higher figure the bargain idea disappeared. Domestic consumers appear to be well covered on their needs for July.

Zinc—Prime western zinc has fallen to the lowest price since 1921, and with that exception the lowest since the panic of 1907-08. Weakness in this market is caused by continuous accumulation of stocks with the resultant pressure of smelters to sell. Easiness is furthered by the frequent dropping of the ore price, this product in the past week being $29 a ton. It is thought that mines will have to do further curtailing of operations at this extremely low figure. Mining companies, on the other hand, are reluctant to close because of the difficulties of re-opening at a later date.

Tin—The market recently showed remarkable steadiness, especially considering the small buying of consumers and the weakness of the stock market, a factor that frequently is important to tin. The new rumors came out about curtailment and the market jumped more than 1 cent. American consumers remained skeptical. Stocks of tin continue to accumulate here and abroad.

Aluminum—Importers now are bound by the terms of contracts to deliver some metal at a reduction of 1 cent. This action is due to the cut of 1 cent in tariff rates but only a very small tonnage is affected. All new business of importers and in the domestic market is at prices that have ruled for more than a year.

Lead—Prices were cut 15 points on Monday, making a reduction of 25 points in the past week. This action was due to lack of business, so that custom smelters did not want to accumulate their intake except very low prices. It is thought that present extremely low prices for zinc and silver and a moderately low price for lead will cause further curtailment of output at various western mines where several metals are produced.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

Copper and brass product prices are based on 12.00c, delivered Connecticut, for copper

SHEETS	
Yellow brass (high)	18.75
Copper, hot rolled	21.75
Red brass (low) 80% cu.	20.12½
Best spring, drawing, spinning brass	21.50
Nickel silver, grade A, 18%	29.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-pound base)	10.00
TUBES AND PIPES	
Seamless yellow brass (high)	23.75
Seamless copper	24.00
Seamless com. bronze, 90%	25.62½
Plumbing, I. P. sizes, yellow	22.75
Brazed brass, 75% cu.	26.25
RODS	
Yellow brass (high, full turnings)	17.00
Naval brass	19.87½
Com. bronze 90%	21.62½
SHAPES	
Brass angles and channels	26.75
Com. bronze angles, channels	28.87½
ANODES	
Copper, untrimmed	19.25
WIRE	
Yellow brass (high)	19.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	7.25 to 7.50
Chicago	7.25 to 7.50
Cleveland	7.25 to 7.50
St. Louis	7.50 to 8.00
HEAVY YELLOW BRASS	
Cleveland	4.50 to 5.00
HEAVY COPPER AND WIRE	
New York	8.50 to 9.00
Boston	8.50 to 9.00
Chicago	9.25 to 9.50
Cleveland	8.00 to 8.50
St. Louis	8.00 to 8.50
RED BRASS BORINGS	
New York	6.75 to 7.25
YELLOW BRASS TUBING	
Cleveland	4.25 to 4.50
LIGHT COPPER	
New York	7.00 to 7.50
Chicago	7.25 to 7.50
Cleveland	7.00 to 7.50
St. Louis	7.50 to 7.75
LIGHT BRASS	
Boston	4.00 to 4.50
Chicago	4.25 to 4.75
Cleveland	3.00 to 3.50
St. Louis	4.25 to 4.50
ZINC	
New York	2.00 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.00
ALUMINUM	
Clippings, soft, Cleveland	12.00 to 12.50
Clippings, hard, Cleveland	10.00 to 10.50
Borings, Cleveland	5.50 to 6.00
Cast, Cleveland	7.25 to 7.50
Cast, Boston	7.50 to 8.00
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	15.50
Brass ingot, 85-5-5-5	11.50

Coke By-Products

Naphthalene Leads Activity—Phenol Spotty—Less Sulphate Wanted

New York, June 24.—Light oil distillates are unchanged, although some reports of shading are heard. Toluol is steadier, but the recent reduction has failed to bring out much heavier volume after the first flurry. Phenol demand continues spotty, some of the large consumers being out of the market. Best grades f.o.b. New York still are quoted at 17.00c. Naphthalene continues the most active in the list, shipments against contracts holding in volume. Some spot business also is reported. Prices for both flakes and balls are firm. Sulphate of ammonia demand has slumped and some shading in prices is reported.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.28
Commercial xylol	0.28

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.16 to 0.17

Per Pound at Producers' Plants

Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½

Per 100 Pounds Delivered

Sulphate of ammonia	$2.10 to $2.20

Quicksilver Holding

New York, June 24.—Quicksilver is easy but quotations are nominally unchanged at $120 to $121 a flask.

Warehouse

Quietness Shows Signs of Continuing—Price Shading Fails to Bolster Situation—Summer Decline May Be Expected

SUMMER lull is setting in and the briskness with which May closed is not expected to be duplicated this month. Quietness is the keynote of the jobber situation. Price concessions have crept in and at some centers have resulted in minimum quotations becoming the price.

New York.—Jobbers report June business slightly better than in May, although trading in general is far from brisk. Prices on most products are unchanged, although easiness continues in sheets. No. 24 black sheets at 3.55c to 3.65c and No. 24 galvanized sheets at 4.25c are subject to cuts.

Buffalo.—June sales of iron and steel from warehouses are running a trifle behind those of May.

Pittsburgh.—Demand shows little change but is slightly less active than a month ago. Bars and plates continue quiet with sheets moving only fairly well. Official prices are unchanged but shading still is noted.

Cincinnati.—Jobbers report tonnage demand equalized in a duller market for structurals and an increased call for bars. Prices remain unchanged.

Chicago—June warehouse sales are holding to the May level. Heavier demand for steel plates from the mills has not been reflected in warehouse activity. Orders are well diversified.

Detroit.—Warehouse business in iron and steel has been almost up to the volume of May, but the good finish of May is not expected to be duplicated by June. Compared with a year ago, demand shows a substantial decline. July and August will be light.

Philadelphia—Warehousemen report rent demand is largely of a spotty slightly improved business, but current with considerable variation from day to day.

Boston.—For the many small jobs that are going ahead in the New England district a fair amount of materials continues to move out of the various warehouses.

St. Louis—Purchasing from iron and steel warehouses, according to the leading interests, is confined strictly to a hand-to-mouth basis. While third quarter prices are established, few consumers have appeared to take advantage of them.

Cleveland.—Quiet situation in the local market continues. Sales of sheets during the first half of June are reported in excess of the May rate. Partial credit, for the increase can be given the fact that No. 24 black sheets are now quoted at 3.60c and galvanized at 4.35c.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

Hot Mill Products Subject to New Quantity Differentials Adopted March 3, 400 to 3999 Pounds Being Base

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York††	3.25c
Philadelphia	2.70c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.25c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFORCING BARS

Baltimore	2.50c to 3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Houston	3.00c
Los Angeles cl.	2.40c
Los Angeles lcl.	2.70c
New York	2.65c to 3.10c
Philadelphia	2.55c
Pittsburgh	2.75c
San Francisco cl.	2.30c
San Francisco lcl.	2.60c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.65c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland ¼ in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

NO. 10 BLUE ANNEALED

Baltimore	3.50c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Angeles	3.85c
New York	3.40c to 3.60c
Portland	3.75c
Philadelphia*†	3.15c
Pittsburgh**	3.25c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	3.95c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c
Detroit	3.95c
Los Angeles	4.75c
New York	3.55c to 3.65c
Philadelphia*†	3.70c
Pittsburgh**	3.65c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (local delivery)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.60c
Houston	5.40c
Los Angeles	5.20c
Pittsburgh**	4.30c
New York	4.25c
Philadelphia*†	4.25c
Pittsburgh**	4.30c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c
Detroit 3/16-in. and lighter	3.30c
Houston	3.65c
Los Angeles	4.30c
New York	3.75c
Philadelphia	3.00c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.65c
Detroit, No. 14 and lighter	3.80c
New York	4.25c
Philadelphia	3.25c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore (c)	3.30c	(a) 3.80c
Boston	3.50c	4.00c
Buffalo	3.15c	3.65c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.35c	3.85c
Cincinnati	3.80c	4.30c
Cleveland	3.40c	3.90c
Detroit	3.65c	4.15c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.40c	3.90c
Pittsburgh	3.35c	3.85c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	4.75c	.....
St. Paul (a)	3.85c	.....
St. Louis	3.60c	4.10c
Tulsa	4.75c	5.14c

(a) Rounds only. (d) Squares only. ½Plus quantity diff.

COLD ROLLED STRIP

Boston, 0.100-inch 500 pounds lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Cleveland (b)	5.95c
Detroit	5.40c
New York	5.05c
Philadelphia (c)	4.95c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	12.50c
Iron bars, round	6.25c
Iron bars, flats and squares	6.50c

††Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Better Demand Appears but Mostly in Small Lots—Foreign Tonnages Less

BETTER conditions have appeared in iron and steel markets on the Coast, though large projects are not frequent. Owing to conditions abroad, less activity is manifested by importers and domestic supplies have less competition. A French pipemaker was low bidder on part of a tonnage at Olympia, Wash. Portland warehouse prices have been stabilized. Prices show no change.

Seattle, June 18.—The iron and steel markets of the Pacific Northwest show little change. Considering general conditions, demand is well maintained although small tonnages predominate. Prices are steady.

Effective June 12, Portland wholesalers agreed to raise their price lists to a parity with the Seattle district. Heretofore the Portland territory has witnessed much price cutting and fluctuation due largely to competition of imported materials. Foreign steel is not so active and that it was deemed expedient to stabilize the Portland market. Steel bars, structurals and plates have been quoted .15c under Seattle, blue annealed sheets and cold finished steel .25c below Seattle. It is believed that it will hereafter be possible to hold prices steady.

Pig Iron and Coke

Foundry activity is below normal and no improvement is expected within 60 days. While some specialty plants are busy, other foundries have practically no work. General business conditions in the industry are reported poor with collections fair. Material buying is at a low ebb as stocks are fairly large. Burn iron is quoted at $26 and No. 1 Columbia at $25.50. Coke prices are unchanged.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Both steel mills have considerable tonnage on books in lots of less than 100 tons but specifications are falling off and no important projects are expected to develop soon. Merchant bars are unchanged at 2.35c and reinforcing at 2.30c. Two contracts were taken by the Pacific Coast Steel Corp. this week, 130 tons for a bridge at Prosser, Wash., and 104 tons for the addition to the Lincoln High school, Seattle. Two road projects in Washington, bids to be opened by the Bureau of Public Roads June 27 and July 2, involve 102 tons of reinforcing. A proposed bridge over the Eugene power canal, Oreg., calls for 35 tons and a state bridge in Marion county, Oreg., will take a total of 17 tons.

Award of 250 tons of plates for a barge to be built for the Foss Co. by the Lake Washington shipyards, Seattle, was divided between A. M. Castle & Co. and Bethlehem Steel Co. Twelve bidders offered figures this week for the government's two mile Bully creek siphon, a unit of the Vale, Oreg., irrigation project, requiring 2,200 tons of plates. Western Pipe & Steel Co. is reported low on steel construction. Award is still pending. Local fabricating plants booked no job of 100 tons or more this week although several small awards were made. Lidgerwood Pacific Co., Tacoma, is completing an unusually large log skidder for the Weyerhaeuser Timber Co. using a total of 225 tons of steel. The Virginia Bridge Co. is reported to have the shapes subcontract for 166 tons for the Clackamas, Oreg., bridge, general contract to Lindstrom & Feigenson noted last week. Bids for the Tacoma steam power plant calling for 200 tons of structurals will be opened June 23. Bids for 149 tons for the Carver Creek, Oreg., bridge are under consideration. Bids for a second bridge in Clackamas county, Oreg., will be received July 1.

Pipe Demand Is Slow

Award will be made within a few days for furnishing Olympia, Wash., with approximately 830 tons of 10, 12 and 16-inch cast iron pipe, bids opened June 17. Representatives of French pipe were low on 501 tons of 16-inch pipe while Pacific States Cast Iron Pipe Co. submitted low figures on 328 tons of 10 and 12-inch centrifugal. No other important pipe contracts are pending.

Pipe Lettings Larger

San Francisco, June 21.—(*By Air Mail.*)—Construction and building activity on the Pacific Coast has increased somewhat and inquiries for structural steel and reinforcing steel bars are becoming more numerous.

Bars, Plates and Shapes

Awards of concrete bars totaled 1583 tons and included 350 tons for a bridge over the Salinas River at Bradley, Calif., placed with an unnamed interest and 200 tons for the Hall of Justice, Pasadena, Calif., secured by the Blue Diamond Co. New inquiries involve 260 tons for an addition to the Rose Bowl, Pasadena, and 193 tons for Los Angeles, bids on which have been opened. Los Angeles quotations on out-of-stock material continue unchanged at 2.40c base, on carload lots, while San Francisco district prices hold at 2.30c.

Plate lettings were the largest in over eight weeks and aggregated 2062 tons. The Steel Tank & Pipe Co. took 200 tons for 3 and 6-inch pipe and for four tanks for the Parr-Richmond Terminal Corp., Richmond, Calif. The Consolidated Steel Corp. secured 150 tons for a gas holder for the Santa Maria Gas Co., Lompoc, Calif. San Francisco placed 300 tons of 20-inch welded pipe, calling for 3/16 and ¼-inch plate, with the Western Pipe & Steel Co. Prices are weak at 2.25c., c.i.f.

Fabricators are encouraged over the volume of new business being placed and are more hopeful over the outlook. Awards totaled 2685 tons, the largest weekly total in nearly nine weeks. The United States Steel Products Co. took 615 tons and 135 tons, respectively, for a bridge over the Salinas River at Bradley and a crossing in Nevada County, Calif., Judson-Pacific Co. secured 500 tons for a chemical plant for the Shell Oil Co. near Bay Point, Calif., Bookings by McClintic-Marshall Co., included 330 tons for two apartments in San Francisco and 140 tons for a store in San Jose. Bids will be opened July 9 for 168 tons for a bridge over the Trinity river in Calif. Plain shapes remain firm at 2.35c, c.i.f.

Other Finished Material

Demand for cast iron pipe has improved and awards this week were the heaviest in over eight weeks. Los Angeles placed 2538 tons with various interests. The Drainage Construction Co. took 350 tons of 4 to 8-inch pipe for Santa Ana, Calif., for the improvement of Main street. Bids were opened on 831 tons for the improvement of Sixty-seventh street, Fullerton, Calif. Los Angeles opened bids on 160 tons of ¾ to 2-inch extra heavy wrought iron pipe.

The navy department awarded 550 tons and of sheet steel for the Mare Island Navy Yard to unnamed interest. Movement of black, blue annealed and galvanized sheets continues to be confined to relatively small lots and no large inquiries are current. Prices are by no means firm at 4.00c, c.i.f. on No. 24 gage galvanized sheets, 3.35c, on No. 24 gage black and at 2.75c on No. 10 blue annealed.

Testing Society Opens Annual Meeting

Atlantic City, N. J., June 24.—The American Society for Testing Materials opened its thirty-third annual meeting here this afternoon with an attendance of 700, a figure surpassing registration up to the same time last year. The initial session featured remarks by President T. D. Lynch and reports of administrative committees, following which technical papers and committee reports were presented on the subject of testing and testing apparatus. Monday all day and Tuesday morning were devoted to committee meetings.

Pig Iron

(*Concluded from Page* 75)

pig iron continues in moderate volume. Inquiries for third quarter are more numerous, but buyers and sellers believe consumption will fall below that of either the first or second quarter. Malleable plants specializing on automotive castings report a sharp decline in specifications. Competition is keener and the minimum price of foundry and malleable has been dropped 50 cents to $18.50, Granite City, Ill., furnace.

Birmingham, Ala., June 24.—Southern furnaces have opened books for third quarter, with the price for local delivery continuing $14, base, and various figures below this quoted at distant competitive points. Further reduction in costs of production of pig iron is reported. Makers of cast iron pressure pipe have placed a few orders.

Toronto, Ont., June 24.—Pig iron sales for third quarter are smaller than those booked at the approach of the first and second quarters. The carryover is larger. Small, spot orders are fair. Prices are steady.

Philadelphia, June 24.—The Baldwin Locomotive Works, Philadelphia, is inquiring for 1000 to 1500 tons of foundry iron of 2½ to 3¼ per cent silicon. This is the first large inquiry here in some time. Eastern Pennsylvania foundry iron now usually is $19, base, furnace. The E. & G. Brooke Iron Co., Birdsboro, Pa., purchased a cargo of foreign low phosphorus ore and is working it into copper free, low phosphorus iron, most of which will be shipped to one consumer and the remainder sold in the market. This grade now is $23.50 to $24, base eastern Pennsylvania furnace.

Link Republic, Trumbull in Stock Syndicate

Youngstown, O., June 24.—Admitting that a pool or syndicate was formed among holders of Trumbull Steel Co. stock that would force the Republic Iron & Steel Co., here, to take over the Trumbull works, Warren, O., as actually happened later, John T. Harrington, of Youngstown, O., told an interesting story in court here. Mr. Harrington formerly was president of Trumbull Steel Co. after the resignation of Jonathan Warner, who organized the company in 1912.

The lawsuit was brought by J. Fred Waldeck, former Trumbull stockholder, and Mr. Harrington was testifying as a defendant. Mr. Waldeck in his petition asks for an accounting of $775,000 transferred by Trumbull directors to Otis & Co. to buy Trumbull Steel stock.

Mr. Harrington testified that the syndicate was formed to bring before Republic directors the possibility of a consolidation of both companies, since Trumbull had an excess of finishing capacity and Republic an excess of unfinished capacity. The witness denied that any of the pool members including Cyrus S. Eaton, of Cleveland, made a penny of profit out of the transaction which was not a profitmaking scheme. He testified that the Trumbull money was used in the market for only three weeks, from Feb. 28 to March 11, 1927, and the syndicate operated for two years, or ending in October, 1928. He declared the pool helped steady the market and eventually led to Trumbull realizing a profit of approximately $700,000.

Hours Cut, Rate Raised

Hartford, Conn., June 24.—A new wage agreement has been signed by the Bridge, Structural and Ornamental Iron Workers of America and associated contractors in this state. The working week has been shortened from 44 to 40 hours, while the hourly rate has been increased from $1.50 to $1.65, providing a continuance of the weekly rate of $66.

Duralumin containing about 94 per cent aluminum, 4 copper and 1 each of manganese and magnesium first was produced in Germany.

Sheet & Tube Merger Again to Fore As Trial Is Renewed at Youngstown

YOUNGSTOWN, O., June 24.—Preparations are going forward today looking to the common pleas court trial here tomorrow of the Bethlehem Steel Co.-Youngstown Sheet & Tube Co. merger cases. The trial is scheduled to start at 9 a.m. Wednesday before Judge David G. Jenkins, presiding jurist on the Mahoning county common pleas bench.

The judge himself in this instance is attracting more local comment than even the extraordinarily talented legal counsel engaged on both sides. The steel business is nothing new to Judge Jenkins. His father was an ironworker in Youngstown mills, and the judge as a young man himself worked in them. He is noted as a keen-minded lawyer, one with whom argumentative attorneys will find difficulty except with a statement of cold facts. He is independent in his manner of thought and expression, cool and quick-witted, and generally is regarded as a liberal on sociological matters.

When the trial of the case brought by petition of Myron C. Wick Jr., one of the Cyrus S. Eaton group opposed to the merger, begins the court will sit as a court of equity. Considerable more legal latitude is permitted in such a trial than in the usual common pleas court. Among counsel for the merger opponents are Harry Crawford, of Squire, Sanders & Dempsey, Cleveland; Luther Day, of Day & Day, also of Cleveland; Clark Chamberlin, Chicago, identified with legal counsel in Mr. Eaton's Middle West utilities, and half a dozen lesser legal lights of Cleveland and Youngstown. Opposing them will be Newton D. Baker, former secretary of war, Cleveland; Judge James B. Kennedy, former president of the Brier Hill Steel Co.; Frederick H. Wood, New York, representing Bethlehem Steel Co. interests; Leroy Manchester, chief counsel for Youngstown Sheet & Tube Co., and a number of other lawyers.

The ruling by Judge Jenkins last Saturday on application of merger opponents for permission to inspect books of the Bethlehem Steel Co. at New York and Bethlehem, Pa., came after four hours of heated argument by counsel on both sides. Mr. Baker declared the proposal of the Eaton group was merely a "fishing expedition" to learn what could be learned. However, Mr. Day for the merger opponents argued that inspection of Bethlehem's books would disclose that the stockholders of the Youngstown Sheet & Tube Co. had been deceived as to the value of Bethlehem stock. To follow the Ohio statutes when the implication of possible fraud was introduced, Judge Jenkins finally ruled that inspection of Bethlehem's books might be made, but he hedged his order with restrictions that private business secrets of Bethlehem shall not be inquired into, such as price of iron ore in the Pickands, Mather contracts, salaries and bonuses to officers, etc.

This inspection of Bethlehem's books began today by Ernst & Ernst, auditors. It is expected that 40 men will be engaged in this work and that the results will be disclosed during the trial. Extra space in court room No. 3, where Judge Jenkins will preside, is being cleared today to accommodate about 20 lawyers engaged in the trial and 25 or 30 newspapermen.

Commerce Commission Involves Steel Corp. in Railroad Test Case

CHICAGO, June 24.—The Elgin, Joliet & Eastern railroad, a subsidiary of the United States Steel Corp., is defendant in United States district court here by government action to compel it to refrain from transporting in interstate commerce any of the products of its parent company or of any of the Corporation's subsidiaries. The government, bringing action by the direction of William D. Mitchell, attorney general, on the request of the interstate commerce commission, seeks to enforce the commodities clause of the interstate commerce act of 1887, whereby it is unlawful for a railroad to carry in interstate commerce commodities manufactured by it or under its direction.

The railroad has been incorporated in Illinois to operate as a common carrier. Its activities are centered in and about this district and its outstanding capital stock is owned by the Steel corporation. Railroad transportation has been furnished by the Elgin, Joliet & Eastern for some time to iron and steel, cement, coal and coke units owned by the parent company and operating income for last year at over $25,000,000 had approximately 60 per cent of this total, according to allegations, made up of revenue from transportation service to Corporation products.

The recent action by the government has been in the background for several years and was contemplated in one instance with the expression of Joseph Eastman of the interstate commerce commission in implying that the Corporation could be made to give up the Bessemer & Lake Erie railroad, another subsidiary, to the Erie railroad. Henry Ford, in selling the Detroit, Toledo & Ironton railroad, foresaw the implications the commodities clause could bring, as his subsidiary carrier was transferring Ford products in interstate commerce. The presumption, however, for several years in the steel-hauling railroads has been that they did not haul anything they produced, and that they have been once removed from the category of the coal-hauling carriers who were construed as producing, selling and transporting companies. Accordingly their actions were not impeded, despite the bulk of their revenue's quite evident source.

The Elgin, Joliet & Eastern railroad case opens a long-contemplated but heretofore inactive enforcement of the commodities clause and marks the rising curtain that can involve as well vital rulings on the Steel corporation's ore roads of Minnesota: the Duluth & Iron Range railroad and the Duluth, Missabe & Northern railroad; its ore, coal and steel line, in the Bessemer & Lake Erie; and in its local district plant lines.

Spang, Chalfant Passes to National Supply

Pittsburgh, June 24.—Acquisition of Spang, Chalfant & Co. Inc., Pittsburgh, by the National Supply Co. will be formally announced soon. Reports of a merger have been current for several weeks. Increased pipe-making facilities for the former are planned as the result of the combination.

Spang, Chalfant operates plants at Etna and Ambridge, Pa., and in addition controls the Oil Well Supply Co., whose business in distribution of supplies for the oil industry is similar to that of National Supply. Spang, Chalfant produces both welded and seamless pipe and is the second largest independent company in this field, with an annual capacity of 650,000 tons. It is planned to increase this capacity shortly in order to accommodate the combined requirements of Oil Well Supply and National Supply.

National Supply has plants at Toledo, O., Carnegie, Pa., and Torrance, Calif. The company also controls Dayton Pipe Coupling Co., Dayton, O.; Superior Engine Co., Springfield, O.; Otto Engine Works, Philadelphia, and other subsidiary organizations. Hillman interests who have controlled Spang, Chalfant are expected to be represented on the National Supply board. No changes are looked for in the Spang management.

National Supply, whose total assets Dec. 31, 1929, were $42,128,249, also has 100 stores and warehouses for distribution of equipment for gas and oil well use. Total assets of Spang, Chalfant Dec. 31, 1929, were $38,727,265.

Algoma to Alter Plant

Toronto, Ont., June 24.—Directors of the Lake Superior Corp. and the Algoma Steel Corp. Ltd. have authorized alterations in the steel plant at Sault Ste. Marie, Ont., to permit the rolling of rails up to 130 pounds and large structural shapes. Preliminary work involves an expenditure of $1,250,000. It is understood that contracts are now being placed.

Employment Index Down

A decrease of 2.4 per cent in employment between April 26 and May 31 is reported by the National Metal Trades association. The association's labor barometer, representing a composite of reports from 26 cities, stood at 96.6 on May 31. The average for 1925-1927 represents 100. Weekly earnings in the metal trades, as reported by the National Industrial Conference board, showed an increase of 1.4 per cent in April, the index figure for the month being 101.5. The base in this instance also is the average for 1925-1927.

Iron Ore

Consumers Revising Estimates of Requirements—Market Dull

IRON ORE PRICES, PAGE 74

Cleveland, June 24.—Again it appears that less iron ore will be needed this year than recently contemplated. Further modification of tonnage arrangements now is in progress between producers and associated consumers. Some buyers have asked to cancel part of their purchases for this season. The movement of ore is slow and it will take some weeks for shippers to gage accurately what will be required this fall. Prices are holding, producers report.

Boston, June 24.—A cargo of 7000 tons of iron ore mined in Russia has arrived at Everett, Mass., consigned to the Mystic Iron Works there. This is reported to be the first iron ore from Russia to be shipped to the Boston district. Additional shipments are to be made if the ore proves satisfactory.

Additional Concrete Projects Pending

(*Concluded from Page* 84)

streets, Chicago.
400 tons, plant addition State Line Generating Co., Calumet, Ill.
260 tons, addition to rose bowl, Pasadena, Calif.; bids being received.
193 tons, for Los Angeles; bids opened.
170 tons, state paving in Tohama county, Calif.; bids opened.
100 tons, state bridge over Trinity river, Trinity county, Calif., bids July 9.
100 tons, hospital, Redwood City, Calif.; bids July 7.
Unstated tonnage, state road work Wisconsin and Indiana.

Blast furnace gas for underfiring coke ovens has been used in Germany for more than 14 years.

Industrial Men in the Day's News

W. S. Rugg, Vice President, Engineering and Sales, Westinghouse Electric & Mfg. Co.

EXACTNESS of the engineer combined with executive ability makes him a valuable member of the Westinghouse family.

IN HIS 38-year connection he has engaged in practically every line of electrical development, introducing many innovations in railway and marine departments.

HE VIEWS each problem from four angles, i.e., the commercial, consumer-advantage, feasibility of application and flexibility of manufacturing.

DURING his 38 years' service with Westinghouse Electric & Mfg. Co., Walter S. Rugg, appointed vice president in charge of engineering and sales as noted in IRON TRADE REVIEW of April 24, has been engaged in almost every line of electrical development. In him are combined the exact and analytical training of the engineer with the broad, economic experience of the commercial executive, gained over a period of years. In this latest appointment, Mr. Rugg takes over the duties of Edward D. Kilburn, who resigned April 16. Once before Mr. Rugg held the position of general sales manager, from 1922 until 1925. In the latter year he was appointed vice president in charge of engineering and he since has been particularly active in transportation on land and sea, having been responsible for inaugurating more efficient methods in both branches of that service.

Born in Brodhead, Wis., Mr. Rugg was graduated from Cornell university. In 1892 he became identified with Westinghouse company at East Pittsburgh, Pa., and three years later was transferred from Pittsburgh to Chicago as district office engineer. The branch office manager there thought he recognized his salesmanship ability and against Mr. Rugg's own inclinations, prevailed upon him to try the selling end, with pleasing results.

Transferred to the New York office as special engineer in 1901, he was made manager there eight years later. He was recalled to the East Pittsburgh works in 1917 to become manager of the railway department and shortly thereafter was made manager of the marine department as well. During his administration of the railway department, started when the electrical industry was at low ebb due to the war, more constructive work was accomplished than in any other department in any similar period. He was promoted in 1920 to be assistant to H. D. Shute, vice president in charge of sales, where his duties gave him special jurisdiction over negotiations and district office personnel. This fitted him for his next promotion in 1922 as general sales manager. When the company made a redistribution of the activities of its vice presidents in 1925, Mr. Rugg was made vice president in charge of engineering, a then newly-created position.

CHARLES L. WOOD, general manager of sales of Carnegie Steel Co., Pittsburgh, since November, 1925, when he succeeded William G. Clyde, now president of the company, was elected vice president, June 19, and will continue as general sales manager. Mr. Wood has been identified with the sales department since the United States Steel Corp. was organized. Before that he was order department manager of the American Steel Hoop Co., which was consolidated with Carnegie. He was born in Youngstown, O., Sept. 11, 1873, and following his graduation from Ohio State university in 1896 served as chemist for Calumet Furnace Co., Chicago. He later engaged in mining and engineering work in the West, and in 1898 became affiliated with Ameri-

can Steel Hoop Co., being made manager of the order department when the company moved to New York.

* * *

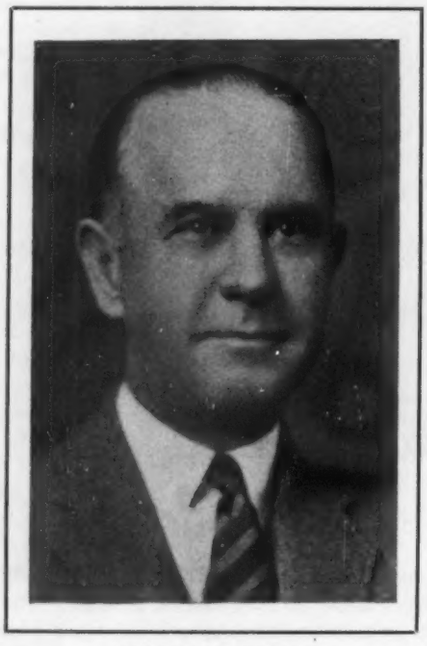
A. L. Humphrey, president of the Westinghouse Air Brake Co., Wilmerding, Pa., was tendered a testimonial dinner at Pittsburgh on June 12, on his seventieth birthday.

* * *

C. W. Avery, president of Murray Corp. of America, Detroit, has also been elected chairman of the board, succeeding H. O. Barker, resigned. Henry Shelden, Detroit, was elected a director to succeed D. W. Gurnett.

* * *

H. W. Petty, salesman in Detroit



CHARLES L. WOOD

territory for Wagner Electric Corp., St. Louis, since April, 1925, has been transferred to Pittsburgh as branch sales manager with headquarters at 5031 Liberty avenue.

* * *

William D. Bliss, president of Bliss Bros. Tool & Die Co., Milwaukee, has been reappointed to the faculty of the college of engineering, Marquette university, Milwaukee, after an absence of two years. He will be head of the chemical engineering department.

* * *

Albert G. Zima, until recently identified with Western Crucible Steel Castings Co., Minneapolis, as metallurgical engineer, has become identified with the development and research department of International Nickel Co. Inc., 67 Wall street, New York, and will specialize on alloy steel castings.

* * *

L. E. Meidinger, who as head of L. E. Meidinger Co., Milwaukee, has represented continuously for 17 years the Hubbard Steel Foundry Co., East Chicago, Ind., and Bliss & Laughlin Inc., Harvey, Ill., at Buffalo, has been elected director of the State Bank of Milwaukee.

* * *

H. N. Otis of Anaconda Wire & Cable Co. recently was elected chairman of the flexible cord group of the National Association of Electrical Manufacturers. He succeeded David S. Davis, who resigned, and is succeeded in the office of vice president by C. A. Scott of the General Cable Corp.

* * *

G. R. Elder has been appointed assistant to Max Kuniansky, made works manager of Radford Pipe Works, Radford, Va., of Lynchburg Foundry Co., Lynchburg, Va., as noted in IRON TRADE REVIEW, June 19.

H. T. Roberts was made works manager at Lynchburg, Va., and Arthur Roberts Jr., his assistant.

* * *

S. R. Ives, manager of Lyle Culvert & Pipe Co., Minneapolis, since March, 1929, when he left the Armco Culvert Manufacturers' association, is returning to that organization as vice president and general manager. He succeeds W. H. Rinearson, who, as noted in IRON TRADE REVIEW, June 12, resigned to become vice president in charge of distribution for A. M. Byers Co., Pittsburgh.

* * *

William Bischoff has resigned because of ill health as general superintendent of Dominion Iron & Steel Co. Ltd., Sydney, N. S., after discharging those duties for eight years. He previously was superintendent of open-hearth furnace departments at Lehigh and Saucon plants of Bethlehem Steel Co.

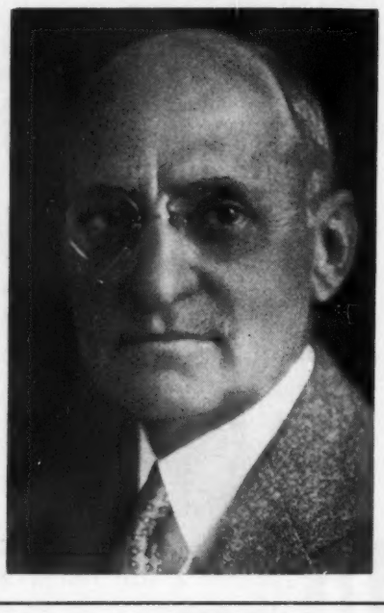
J. H. Fraser has been appointed general superintendent to succeed Mr. Bischoff. William Bown and C. M. Anson have been appointed assistant general superintendent and assistant general manager in charge of steel plant operations, respectively.

* * *

William R. Burrows, vice president of General Electric Co., Schenectady, N. Y., since May 25, 1927, has been elected chairman of the manufacturing committee to succeed Cummings C. Chesney, also a vice president, who is relieved at his own request and will tour Europe during the summer. Mr. Burrows from 1917 until 1925 was works manager of the Edison Lamp Works, Harrison, N. J., and when it was merged with National Lamp Works, Cleveland, in 1925, he was appointed associate manager, with T. W. French, of the incandescent lamp department of General Electric Co.

* * *

J. L. Reiber has been appointed general sales manager of St. Louis Gas & Coke Corp., St. Louis and Granite City, Ill., to succeed J. C. Gore, who resigned as noted in IRON TRADE REVIEW of June 19. He will have jurisdiction over all products including pig iron, coke, slag and by-products of the coke ovens. For 11 years Mr. Reiber was connected with Carnegie Steel Co., Pittsburgh, and about 1919 he was made sales manager of Rainey-Wood Coke Co., Philadelphia. Late in 1924 he also became vice



FRANK A. MOESHEL

Vice president in charge of sales, Newport Rolling Mill Co., Newport, Ky., and Globe Iron Roofing & Corrugating Co., who, as noted in IRON TRADE REVIEW of May 29, has completed 40 years service.

president in charge of sales of W. J. Rainey Inc., New York. Immediately prior to his affiliation with St. Louis Gas & Coke Corp., he was with A. H. Davis & Co., Pittsburgh, coal operators.

* * *

William Miller was recently appointed superintendent of bessemer and blooming mill departments, Newburgh, O., works, American Steel & Wire Co., Cleveland, to succeed Henry M. Watt, who has retired after 49 years with the steel industry, 21 of which were in the Newburgh position.

Mr. Miller has been affiliated with United States Steel Corp. plants practically all his life. As a boy he was employed at Schoenberger works, American Steel & Wire Co., Pitts-

(*Concluded on Page* 97)

Price Cut Fails to Aid German Mills

Domestic Market Down 95 Cents a Ton, Works Dismiss Employes—European Conditions Show Little Change—Middlesbrough Furnaces Reduce Output

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, June 24.—(*By Radio*)—Iron and steel markets throughout Europe continue depressed. German producers have reduced domestic prices an average of 4 marks (95.4 cents) a ton, following a wage reduction of 7½ per cent as announced last week. The full effect of the price reductions has not been felt, as markets are lifeless and steelworkers are dismissing employes. German rail mills have booked a few export orders.

A slight improvement in business is reported in Belgium, under fixed price schedules. The markets in France are dull.

No reduction in British steel prices is contemplated. Continental producers are making efforts to capture orders in Great Britain, but demand is greatly restricted. General market conditions are unchanged, excepting additional municipal pipe orders. Demand for galvanized sheets has gained slightly and tin plate business is fair.

Middlesbrough furnaces are curtailing output of pig iron to avoid accumulating heavier stocks. Continental pig iron is competing against the British product in foreign markets.

Dullness Rules in British Steel Market

BIRMINGHAM, Eng., June 13.—(*European Staff Service*)—The Whitsuntide holiday has interfered with business in all markets this week and at the Birmingham exchange yesterday there was very little inquiry or interest. Works have been closed for the week in South Staffordshire and stocks of pig iron have necessarily increased, though there seems no prospect of curtailment of output soon. Unless there is fair buying in the next few weeks, however, stocks are likely to be uncomfortably heavy, especially at Northampton furnaces. In Derbyshire the strain is not so severe as pipe foundries are able to absorb a fair proportion of pig iron output. Midland furnacemen are of the opinion that reductions would not bring more business under present conditions.

In South Staffordshire there is a steady demand for finished iron bars of best quality but other branches of the iron trade are stagnant. Makers complain that wrought iron production is costly, owing to the high scale of wages and heavy expenditure on pig iron, in addition to which their prices are hopelessly out of competition with English steel or with foreign iron bars. Continental merchants are not getting much business from this area, but are cutting prices recklessly. This is particularly evident in No. 3 Belgian iron bars and they are at least £3 ($14.58) cheaper than Staffordshire material even when carriage from the port is taken into account. Merchants are of the opinion that if there were any real demand for foreign steel in this district they would be able to undercut the cartel prices. Wage cuts in Germany indicate that manufacturers are desirous of bringing trade by lowering prices, but it remains to be seen whether such a policy is pos-

Current Iron and Steel Prices of Europe

Export Prices f. o. b. Ship at Port of Dispatch—By Cable

Dollars at Rates of Exchange, June 23	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.40	3 7 6*	$16.28	3 7 0	$16.28	3 7 0	$16.28	3 7 0
Basic-Bessemer	15.92	3 5 6†	15.07	3 2 0	15.07	3 2 0	15.80	3 5 0
Hematite, Phosphorus 0.02-0.05	17.98	3 14 0	24.69	630*	.....	....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$29.77	6 2 6	$22.84	4 14 0	$22.84	4 14 0	$22.60	4 13 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	30.38	6 5 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars	1.74c	8 0 0	1.18c	5 7 6	1.18c	5 7 6	1.18c	5 7 0
Structural shapes	1.68c	7 15 0	1.12c	5 1 6	1.12c	5 1 6	1.12c	5 1 6
Plates, ship, bridge and tank	1.79c	8 5 0	1.44c	6 10 6	1.44c	6 10 6	1.49c	6 15 0
Sheets, black, 24 gage	2.17c	10 0 0	2.15c	9 15 0	2.15c	9 15 0	2.20c	10 0 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.52c	11 8 9	2.52c	11 8 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.29c	5 17 6	1.29c	5 17 6	1.29c	5 17 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.76c	8 0 0	1.76c	8 0 0	1.73c	7 17 0
Wire nails, base	2.39c	11 0 0	1.46c	6 12 6	1.46c	6 12 6	1.49c	6 15 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 8.99	1 17 0

*Francs

Domestic Prices at Works or Furnace—Last Reported

		Francs		Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$16.40 3 7 6	$19.26	490(2)	$17.30	620	$20.28 85
Basic pig iron	15.92 3 5 6	20.63	525(1)	15.07	540	21.71 91
Furnace coke	3.40 0 14 0	6.60	168	6.00	215	5.13 21.50
Billets	29.77 6 2 6	24.36	620	22.60	810	28.87 121
Standard rails	1.79c 8 5 0	1.46c	810	1.62c	1,245	1.51c 140
Merchant bars	1.74c 8 0 0	1.22c	680	1.25c	965	1.52c 141
Shapes	1.84c 8 10 0	1.26c	700	1.22c	940	1.49c 138
Plates, ship, bridge and tank	1.95c 9 0 0†	1.46c	810	1.52c	1,170	1.71c 158
Sheets, black, 24-gage	2.28c 10 10 0	2.72c	1,510	2.60c	2,000	1.40c 130
Sheets, galvanized 24 gage, corrugated	2.58c 11 17 6	3.52c	1,955	3.06c	2,300	3.78c 350
Plain wire	2.06c 9 10 0	2.03c	1,125	2.15c	1,650	2.43c 225
Bands and Strips	2.17c 10 0 0	1.37c	760	1.50c	1,150	1.77c 164

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

sible or even desirable in the British iron and steel trade. The Steel association, which controls a number of heavy steel products in Britain, is likely to review prices within the next fortnight and a number of users believe pressure from buyers will be sufficient to bring some concessions, although they may be small in view of production costs and heavy overhead charges.

There is little life in the steel trade. Structural engineers feel the lack of bridge work, which in normal times provides a big outlet. At the moment large establishments are engaged in fierce competition for small building contracts which, when the final price is fixed, leave little room for profit and do not find sufficient employment for more than a few men. Steel rails are being rolled both at Barrow and Sheffield for the home railways and in the Barrow district a little more inquiry encourages the belief that conditions may improve shortly. At a launch of three submarines at Barrow this week a representative of Vickers Armstrongs Ltd. announced that the call for disarmament had made a considerable difference in the state of employment at their shipyards. Twelve months ago there were employd at Barrow 13,500, but at present it was just short of 11,000. His firm, however, had received orders from the British admiralty for the construction of two destroyers and also the main machinery for the cruiser LEANDER now being built at Devenport.

The depression in the Welsh tin plate trade is reflected in North Lincolnshire, where for a long period there has been activity in producing tin plate bars for associated works in South Wales. It is believed restarting of two furnaces at one works will be counterbalanced by reduced production at other steelworks in the vicinity. Heavy steel melting scrap is now quoted at £2 12s 6d ($12.75) at Sheffield works, £2 10s ($12.15) at Birmingham and £2 17s 6d ($13.96) in South Wales. There is little call for scrap, however, and it is believed that prices have not yet touched bottom.

Prices are weaker in the Welsh tin plate trade as a result of the downward tendency of tin. They are now based on quotations ranging from 18s ($4.38) to 18s 3d ($4.44) per basis box f.o.b. Operations have been curtailed this week for the holidays and in some cases the break has been extended, owing to warmer weather and lack of orders for immediate delivery. Most manufacturers have good order books for second half. Some inquiries have come in from most of the export markets, including the Continent, the Far East and South America.

Galvanized sheets continue quiet in all markets. In Birmingham there is a scarcity of orders and the difficulty of obtaining export business is a feature of the Welsh trade.

German Steel Market in Dull State

Berlin, June 10.—(*European Staff Service*)—Necessity for a reduction of current prices at a large rate is reflected by the deplorable state of affairs on the domestic market. The building trade is slack as a result of shortage of capital, and the working-up industries are, to a large extent, no longer in a position to compete with foreign manufacturers. Dismissals of workers are therefore frequent. United Steel Works Co. recently has dismissed about 1200 miners, and all other large producers are in a similar position. The August-Thyssen smelter, the most modern plant of the United Steel Works Co., which is mainly working on export trade, is operated at only 56 per cent of capacity. The Mannesmann Pipe Co. reports a further decline of activity, although it is expected that it will not be possible for consumers to postpone requirements much longer.

Domestic purchases of semifinished goods and structural shapes are limited. Stagnation in the market for merchant bars continues, and sales of plates and sheets have not improved. The better tendency which prevailed in the pipe market during April has disappeared. Altogether the market is dull and uninteresting.

No better reports are made with regard to export business. A few foreign orders for rails have not contributed much to help the situation. Merchant bars are quoted at an unchanged rate of about £5 7s ($26.03), and beams at about £5 1s ($24.57). Demand for bands is limited, while interest so far shown for plates has been further reduced. Unsatisfactory conditions in foreign countries are having an unfavorable influence on activity of German steel plants, and at present there are scarcely any hopes of an amelioration.

The situation in pig iron is dull, and it is expected additional blast furnaces will have to be damped.

British Output Down

London, June 13.—(*European Staff Service*)—Production of pig iron in Great Britain in May was slightly below that of April. It included 187,700 tons of hematite, 248,300 tons of basic, 130,700 tons of foundry and 23,600 tons of forge pig iron.

The output of steel ingots and castings in May almost equaled that of April. Comparative figures follow, in gross tons:

(Gross tons)

Mon. ave.	Act. Fur. on last day	Pig iron	Steel ingots and castings
1913	338(*)	855,000	638,600
1927	149	607,700	758,100
1928	132	550,900	710,400
1929	162	631,600	804,566
1930			
Jan.	159	650,000	771,100
Feb.	162	607,000	776,400
March	157	665,800	826,100
April	151	619,600	696,100
May	141	614,500	692,800

(*) Average for year.

Austrian Steelmaker Had Good Year

Berlin, June 10.—(*European Staff Service*)—The report of the Austrian company, Alpine Montangesellschaft, for 1929 gives the following figures of production, the output for 1928 being given in parentheses: Coal 1,145,907 metric tons (1,072,248 tons); iron ore, 1,866,575 tons (1,913,129 tons); pig iron, 457,499 tons (485,329 tons); raw steel, 541,303 tons (446,824 tons); semifinished steel for sale, 71,335 tons (70,463 tons); rolled products, 288,680 tons (279,640 tons).

The turnover for the year showed an increase over the figure reached in 1928, due partly to increase in business, and to a smaller extent to increase in prices caused by the rise in railroad rates. During the year exports attained 32 per cent of the production of pig iron, against 61 per cent in 1928, 40 per cent for semifinished steel, compared with 43 per cent, and 27 per cent for rolled steel, against 32 per cent. A dividend of 4 per cent was declared.

It is noted that the number of men employed, which was 13,400 on a monthly average, now has gone down to 11,000 and it is expected that it will further decrease. May 20, 1929, the volume of orders on books was two-and-a-half-times larger than today. The output of the collieries is to be restricted. Part of the iron and steel works is being stopped. Only three of five blast furnace stacks are operated, and 11 of 14 open-hearth furnaces, which shows that present conditions are as favorable as a year ago.

Belgian Exports Gain, Imports Decline

Brussels, June 10.—(*European Staff Special*)—Exports of pig iron from Belgium and Luxemburg for March and first quarter exceeded the same period in 1929. Exports of other iron and steel products reached the highest monthly figure since December, 1929. For the first three months of this year exports of steel products totaled 1,091,500 metric tons, as against 958,000 tons for the first quarter of 1929.

Imports of pig iron into Belgium and Luxemburg for first quarter were 124,635 tons, against 143,220 tons for first quarter of 1929. Imports of other iron and steel products for the first three months were 99.500 tons, against 124,000 tons in the corresponding period of 1929. Comparative figures follow, in metric tons:

	—IMPORTS—		—EXPORTS—	
Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1927	31,760	28,000	11,350	388,000
1928	45,910	38,000	8,240	380,000
1929	56,150	37,000	10,090	394,500
1930				
Jan.	44,274	37,200	13,551	392,000
Feb.	38,121	32,700	7,320	295,600
March	42,240	29,600	9,412	403,900

French Coke Falls Off

Paris, June 10.—(*European Staff Service*)—Output of coke at French works in April showed a decline from March, the March figure being the highest on record. Imports of coke gained, coming mostly from Germany, 306,656 tons, Holland, 84,265 tons, Belgium, 55,041 tons, and Great Britain, 4475 tons. Comparisons follow, in metric tons:

Mon. ave.	Production	Imports	Exports
1913	335,620	255,835	17,085
1927	339,015	395,580	33,430
1928	366,660	447,330	34,810
1929	397,435	453,720	39,070
1930			
Jan.	414,797	442,754	37,473
Feb.	392,950	403,887	15,905
March	443,909	385,742	11,779
April	419,348	450,437	13,371

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

HUBBARD STEEL FOUNDRY CO., East Chicago, Ind., Duquesne Steel Foundry Co., Pittsburgh, and Wheeling Mold & Foundry Co., Wheeling, W. Va., have been consolidated as the Continental Roll & Steel Foundry Co.

Albert Pack, formerly chairman of the board of Hubbard Steel Foundry Co., is chairman of the board and J. T. Osler, formerly president of the Hubbard company, is president. Donald C. Bakewell, formerly president of Duquesne Steel Foundry Co., Herbert E. Field, former vice president of Wheeling Mold & Foundry Co.; William E. Trautman, former vice president of Duquesne Steel Foundry Co.; and W. H. Seaman, former vice president of Hubbard Steel Foundry Co., are vice presidents. D. R. Wahlberg is secretary-treasurer.

The directorate consists of these officers and Harold Beacom, of Winston, Strawn & Shaw, Chicago legal firm; D. A. Burt, chairman of the executive committee, Wheeling Mold & Foundry Co.; Andrew H. Scott, president of Cochran, Scott & Co; J. J. Shinners, vice president of H. M. Byllesby & Co., Chicago, and Howard Whitehouse, vice president of the Continental Illinois Co., Chicago.

Main offices will be in Chicago for the present. Representation of H. M. Byllesby & Co. and the Continental Illinois Co. on the board discloses that important financial groups have become associated with the consolidated enterprise.

* * *

UNIVERSAL PIPE & RADIATOR CO., New York, reports a net loss, after all deductions, of $114,020.97 for first quarter, compared with net earnings of $10,622.76 for the same quarter of 1929. March showed a small profit and the improved condition has continued, a profit for second quarter being assured.

* * *

BIERSACH & NIEDERMEYER CO., Milwaukee, sheet metal works, for 42 years of its 57 in the same location on Fifth street, has moved to 661 Hubbard street, where 40 per cent more floor space is available. Latest equipment for sheet metal fabrication has been installed. Fabrication of sheet aluminum, of sheet steel down to 3/16-inch and sheet and plate welding have been added to its facilities.

* * *

GENERAL INSULATING & MFG. CO., Alexandria, Ind., has moved its New York office from Brooklyn to 370 Lexington avenue, New York. William C. Hyatt is manager.

* * *

AMERICAN MACHINE & FOUNDRY CO. and International Machine & Foundry Co., Brooklyn, N. Y., affiliated companies, have increased capital stock of the former from 300,000 to 1,500,000 shares and of the latter from 300,000 to 600,000 shares.

* * *

THOMPSON PRODUCTS INC., Cleveland, has taken for its aeronautical division an order for 2000 aircraft valves to be used in 100 Bristol Jupiter engines being built by the E. W. Bliss Co., Brooklyn, N. Y. The latter has a special contract with the Bristol Jupiter Co., of England, to build airplane engines in this country.

* * *

HATFIELD ELECTRIC CO., Indianapolis, has taken a contract from the Soviet Russian government for engineering supervision of electrical equipment for a large steel plant being built at Magnitogorsk by Arthur G. McKee Co., Cleveland. Installation will include electrification of mining, ore handling and steel plant equipment and a large power station. C. F. Crowley, vice president, is supervising the work, being carried on by the company's branch at Cleveland.

* * *

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., through its subsidiary, Westinghouse Electric International Co., has entered into an arrangement with the English Electric Co. Ltd., Queens House, Kingsway, London, for an exchange of technical information between the two organizations on steam turbines and electrical equipment. Each company will have the benefit of results of research work by both in the field covered by the agreement. Financial participation in the English concern by Westinghouse, not to exceed 10 per cent, is under consideration.

* * *

WALTER-WALLINGFORD & CO., with offices at Cincinnati and Chicago, have been made exclusive agents for the sale of foundry and domestic coke produced by the Portsmouth By-product Coke Co., a subsidiary of the Wheeling Steel Corp., effective July 1.

* * *

LANGELIER MFG. CO., Providence, R. I., manufacturer of machinery, has bought the capital stock of Adams Bros. Inc., Providence, manufacturer of foot presses, screw presses, transfer presses and other machinery for use by manufacturing jewelers. This line of production will be continued. Herbert K. Allard is president of the Langelier company.

* * *

CANADIAN AUSTIN CAR CO. LTD. has been organized as a branch of the Austin Co., Birmingham, Eng., manufacturer of motor cars, and has established a plant at 297 Campbell avenue, Toronto, Ont. E. P. Clarkson is managing director. Assembly will be started shortly and manufacture of the Austin car will follow later.

* * *

FORT WORTH TANK & CULVERT CO., Fort Worth, Tex., has been organized to fabricate tanks, culverts and other metal products by M. A. Gay, president, E. M. Stephens, vice president and M. A. Buchanan, secretary-treasurer. A plant 50 x 100 feet has just been completed at 1100 North Commerce street.

* * *

A & Z BOILER & TANK CO., Fort Worth, Tex., has moved its offices and plant to 601 North street, former location of the Texas Boiler & Tank Co., whose assets it recently acquired at a bankrupt sale. W. A. Atherton and George E. Zaner are officers.

Surpius coal cars May 31 totaled 148,873, an increase of 1913 cars within approximately a week, while surplus box cars totaled 233,664, an increase of 11,454 cars for the same period.

Auto Output Off in May

Washington, June 24.—May automobile production at 417,154 units fell off from the high of 1930 in April when 442,835 units were turned out. May, however, was the second highest month of the year. Five-month totals, according to reports from 144 principal manufacturers to the department of commerce, stand at 1,883,616 units, contrasted with 2,679,511 units over the same period of 1929. Canadian total shows a rise in May, according to reports to the Dominion bureau of statistics. Figures follow:

	United States			
1929	Total	Passenger cars	Trucks	Canada Total
May	604,691	514,863	88,510	31,559
Total (5 mos.)	2,679,511	2,311,926	350,330	166,869
June	545,932	451,371	93,183	21,492
July	500,840	424,944	74,842	17,461
August	498,628	440,780	56,808	14,214
September	415,12	363,471	51,576	13,817
October	380,017	318,462	60,687	14,523
November	217,573	167,846	48,081	9,424
December	120,007	91,011	27,513	5,495
Total (yr.)	*5,358,420	4,569,811	771,020	263,295
1930				
January	*275,374	236,145	38,657	10,388
February	*346,940	296,461	49,457	15,548
March	*401,313	335,720	64,204	20,730
April	*442,835	374,710	67,560	24,257
May	417,154	362,270	54,370	24,672
Total (5 mos.)	1,883,616	1,605,306	274,248	95,595

*Revised.

Stokers Decline in May

Washington, June 24.—May sales of mechanical stokers totaled 96, showing a decline from the high in April of 108. Sales for May, 1929, were 174 and 5-month totals for 1930 are lower than totals in each class during the same period of last year. Revisions are to be noted in the following table by the department of commerce:

1928	Stokers sold	Fire tube boilers	Water tube boilers
May	174	64	110
Total (5 mos.)	609	209	400
June	203	82	121
July	186	88	98
August	199	94	105
September	155	71	84
October	178	89	89
November	107	43	64
December	79	30	49
Total (year)	1,716	706	1,010
1930			
January	53	24	29
February	73	26	47
March*	89	45	44
April*	108	46	62
May	96	41	55
Total (5 mos.)	419	182	237

*Revised.

Malleable Still Down

Washington, June 24.—With production at 53.7 per cent of capacity in May, malleable castings' output dropped to 53,729 tons, to register the lowest monthly mark of 1930. Five-month totals of production and shipments are considerably under 1929 figures for the corresponding period. A decline is to be noted in operations for the fourth consecutive month this year. Department of commerce reports the following monthly figures:

1929	Production net tons	Shipments net tons	Orders booked net tons	Per cent of capacity operated
May	81,641	80,527	76,949	83.7
Total (5 mos.)	395,750	390,882	399,233	.....
June	72,232	72,846	65,315	74.9
July	70,600	69,618	61,358	73.5
Aug.	69,173	69,824	62,541	70.6
Sept.	59,087	62,571	52,647	61.2
Oct.	65,526	58,733	61,164	66.7
Nov.	46,459	46,487	40,145	47.7
Dec.	46,029	47,689	43,475	47.3
Total (year)	824,856	818,150	785,878	71.3
Jan.	61,381	57,820	58,009	61.6
Feb.*	65,942	59,971	61,606	67.4
March*	63,464	65,164	60,915	64.6
April*	62,035	60,884	54,685	63.1
May**	53,729	56,474	47,527	53.7
Total (5 mos.)	306,551	300,313	282,742	62.1

*Revised.
**Preliminary.

Steel Furniture Off

Washington, June 24.—New orders for steel furniture touched the lowest point since September, 1929. Shelving orders also were low and shipments in both classes declined from April. Five-month totals show 1930 lagging in comparison with 1929 and a definite upward trend is yet to be noted this year. Monthly figures follow:

	Business Group		Shelving	
	New orders	Shipments	New orders	Shipments
	(In Dollars)			
1929				
May	2,936,728	2,824,130	1,120,990	989,120
Total (5 mos.)	15,855,052	15,642,788	5,381,083	5,100,633
June	2,553,233	2,544,037	958,866	920,355
July	2,590,202	2,658,801	939,057	867,496
Aug.	2,417,725	2,482,594	931,468	889,947
Sept.	2,294,169	2,313,984	879,610	842,635
Oct.	2,842,486	2,983,615	927,578	979,236
Nov.	2,900,452	2,631,079	801,223	859,697
Dec.	2,583,220	2,781,610	735,452	856,011
Total (year)	34,036,539	34,038,608	11,554,337	11,322,010
1930				
Jan.	2,886,035	2,890,816	724,946	674,704
Feb.	2,370,426	2,549,650	758,690	682,752
March	2,627,339	2,726,519	839,189	812,080
April	2,523,746	2,427,006	796,100	814,706
May**	2,313,294	2,349,911	725,243	751,521
Total (5 mos.)	12,720,840	12,943,902	3,844,168	3,735,764

**Preliminary.

Foundry Orders Shrink

Cleveland, June 24.—For the fourth consecutive month the index of gross orders for foundry equipment registered a decline when May's index fell to 92.7. This is the lowest order index since September, 1927, according to the Foundry Equipment Manufacturers' association. Index of gross orders was 126.5 in May, compared with 161.1 in April; index of shipments slumped to 149.4 in May from 217.4 in April; and unfilled orders' index shrank to 179.3 contrasted with April's 291. Following shows gross orders' comparison:

	1927	1928	1929	1930
Jan.	180.4	132.7	180.5	160.1
Feb.	198.0	123.6	197.0	196.4
Mar.	131.1	138.6	209.4	164.1
Apr.	130.1	107.7	172.6	122.8
May	134.8	325.6	177.7	92.7
June	138.4	149.1	177.3	.....
July	89.9	94.8	218.6	.....
Aug.	106.4	278.0	229.5	.....
Sept.	80.4	170.0	216.3	.....
Oct.	98.0	185.0	245.3	.....
Nov.	95.8	197.8	128.6	.....
Dec.	106.8	166.5	208.0	.....

Base: Average monthly shipments for 1922-23-24 taken as 100.

Structural Orders High

Washington, June 24.—Fabricated structural steel production stood at 75 per cent of capacity in May and tonnage totaled 236,323 tons. Production compares favorably with the high for 1930, set in February. Despite greater 5-month tonnage totals in 1929 compared with 1930, production thus far in the year holds without a downward trend. Reports by the principal manufacturers to the department of commerce are shown in the following:

	New Orders			Shipments
1929	Tonnage	Per cent of capacity	Computed tonnage	Computed tonnage
May	284,429	89	342,650	311,850
Total (5 mos.)	1,308,524	82	1,574,650	1,412,950
June	287,769	90	346,500	288,750
July	292,206	91	350,350	304,150
Aug.	301,808	94	361,900	338,800
Sept.	263,842	83	319,550	315,700
Oct.	282,847	89	342,650	350,350
Nov.	187,823	59	227,150	284,900
Dec.	263,190	83	319,550	265,650
Total (yr.)	3,187,509	83	3,842,300	3,561,250
1930				
Jan.	211,875	63	252,000	244,000
Feb.*	236,897	71	284,000	288,000
March*	207,651	62	248,000	280,000
April*	194,874	59	236,000	304,000
May**	236,323	75	300,000	280,000
Total (5 mos.)	1,087,620	66	1,320,000	1,396,000

*Revised.
**Preliminary.

Help Finance Standards

The American Railway association has joined various organizations in contributing to the finances of the American Standard association, 29 West Thirty-ninth street, New York. The Railway association will contribute $15,000 a year for three years. Other organizations which are underwriting the American Standard association include the United States Steel Corp., Bethlehem Steel Co., Youngstown Sheet & Tube Co., Ford Motor Co., Aluminum Co. of America, General Electric Co., and General Motors Corp.

One of the first American sheet rolling mills was built in Pittsburgh in 1818 by the Pittsburgh Steam Engine Co.

Men of Industry

(*Continued from Page* 92)

burgh, where he rose to be bessemer and blooming mill superintendent. When that plant was dismantled, he was transferred to Gary works, Illinois Steel Co., to have charge of the duplexing department. He recently has been connected with Arthur G. McKee & Co., Cleveland, engineers, preparing plans for a Russian steel plant.

* * *

David T. Croxton was elected a director of Corrigan, McKinney Steel Co., Cleveland, when the board of directors was enlarged to ten members, June 19. At a recent meeting of the directorate Mr. Croxton was elected assistant to the president.

* * *

Hawyard Niedringhaus, formerly vice president of Granite City Steel Co., Granite City, Ill., was recently elected president to succeed Alfred J. Kieckhefer. Mr. Kieckhefer, who is president of National Enameling & Stamping Co., continues a director of Granite City Steel Co.

* * *

C. E. Johansson, inventor of the Johansson gaging system and head of the Johansson division, Ford Motor Co., Detroit, has been knighted by King Gustav of Sweden in the royal order of the north star. Mr. Johansson perfected his invention, a precision measuring system, in 1898. He was born in Sweden and plans to return, as soon as business conditions permit, to receive his knighthood.

* * *

Frank Dustan, of the engineering department of Putnam Machine Works of Manning, Maxwell & Moore Inc., New York, has been appointed chief engineer. Mr. Dustan's education in Canada was followed by six years' training with General Electric Co., Schenectady, N. Y. Later he became affiliated with Nova Scotia Steel & Coal Co. He was appointed master mechanic of one of the largest munitions plants in Canada during the war. In 1919 he became connected with Manning, Maxwell & Moore Inc. as a designer and later became assistant chief draftsman and then sales engineer, specializing in railroad and steel mill machinery.

Belknap Hardware & Mfg. Co., Louisville, Ky., has decreased its capital from $7,000,000 to $6,000,000.

Canada's Iron Output Up

Toronto, Ont., June 24.—Production of pig iron in Canada during May, at 80,505 tons, was 11 per cent higher than the 72,339 tons in April and only 1 per cent below the 81,464 tons for May, 1929. Output of malleable iron rose sharply to 12,635 tons from 2826 tons in April; foundry iron at 11,387 tons showed little change from 11,175 tons in the previous month, and basic iron dropped from 59,338 tons to 56,462 tons. For five months of 1930 production aggregated 385,105 tons, a decline of 10 per cent from the total of 428,684 tons reported for the corresponding period of 1929.

Output of ferroalloys during May amounted to 7766 tons, as compared with 7939 tons in April, and consisted chiefly of ferrosilicon, and ferromanganese.

Production of steel ingots and direct steel castings during May, at 91,692 tons, was the lowest tonnage reported for any month to date, being 11 per cent under the 102,681 tons in April, and 25 per cent less than 125,372 tons for May, 1929. Steel ingots dropped from 95,095 tons in April to 85,040 tons, and steel castings declined from 7586 tons to 5652 tons. For the five months ending in May, cumulative production of ingots and steel castings at 533,672 tons was 14 per cent lower than the 619,337 tons for the corresponding five months of 1929, and included 499,418 tons of ingots and 34,454 tons of castings.

Babbitt Use Shows Gain

Washington, June 24.—Total apparent consumption of babbitt metal in May was 3,932,501 pounds, comparing with 3,868,408 pounds during April. May manufacturers' sales showed an increase and at the same time producers' consumption slumped. The monthly comparison following is based on department of commerce reports from 31 firms:

1929	Total apparent consumption	Sold by manufacturers	Consumption by producers
	(Figures given in pounds)		
May	5,478,697	4,248,662	1,230,035
Total (5 mos.)	29,804,265	23,797,786	6,006,479
June	5,927,907	4,820,953	1,106,954
July	5,360,711	4,047,887	1,312,824
August	5,432,597	3,997,427	1,435,170
September	5,225,004	3,887,599	1,337,405
October	5,518,851	4,007,260	1,511,591
November	4,522,034	3,205,689	1,316,345
December	3,343,492	2,394,159	949,333
Total (year)	65,134,861	50,158,760	14,976,101
1930			
January	4,408,455	3,405,041	1,003,414
February	3,426,576	2,525,771	900,805
March	5,051,575	4,039,395	1,012,180
April	3,868,408	2,838,877	1,029,531
May	3,932,501	3,225,298	707,203
Total (5 mos.)	20,687,515	16,034,382	4,653,133

Obituaries

WILLIAM HENRY BRISTOL, 70, president of Bristol Co., Waterbury, Conn., inventor of numerous recording instruments, died June 18 at New Haven, Conn, following illness of several months. Born in Waterbury, he was graduated in 1884 from the Stevens Institute of Technology. He was then appointed a mathematics instructor at Stevens and later a professor. He founded the Bristol Co. in 1899 to manufacture and market his inventions. For these he received many medals.

* * *

John P. Luitink, 67, vice president of Luitink & Sons Mfg. Co., Milwaukee, manufacturing metal stampings, died June 14.

* * *

Anthony Foederer, 69, president of the B. & F. Mfg. Co., Indianapolis, foundry and machine shop, which he aided in founding ten years ago, died June 12. Born in Sigmaringen, Germany, he came to this country in 1881. He has been associated with the foundry business since he was 15 years old and before locating in Indianapolis in 1920, was in Dayton, Ind.

* * *

Douglas G. Harvey, 46, president of Reynolds Wire Co., Dixon, Ill., died as the result of a heart attack at New Haven, Conn., June 12, while attending a class reunion at Yale university.

* * *

Frank V. Knauss, 80, president and founder of the Portsmouth Stove & Range Co., Portsmouth, O., died recently. He also was president of the Madsenell Corp., New York, and a director of the Auto Finance Corp., Newark, N. J.

* * *

J. S. Crowther, 47, assistant general manager of Interlake Iron Corp., Chicago, for the past four years, died June 13 at Toledo, O. For several years he was general superintendent of Toledo Furnace Co., Toledo, which, with several other interests, merged to form Interlake Iron Corp.

CONSTRUCTION and ENTERPRISE

Concise, Timely Business Building Opportunities from Field of Industry

CHICAGO—Internal Motor Parts Co., 1427 South Michigan avenue, has leased a 1-story, 29 x 142-foot plant on Indiana avenue.

CHICAGO—Howard Machine & Wrench Co., 2417 North Ashland avenue, D. Howard owner, has been awarded a building permit for a 2-story, 24 x 84-foot shop addition to cost approximately $5500.

CHICAGO—Berger Mfg. Co., Canton, O., subsidiary of the Republic Steel Corp., has leased 25,000 feet of floor space from the Lanzit Corrugated Box Co., 2509 West Twenty-second street. Berger company manufactures sheet metal products.

CHICAGO—Art Metal Construction Co., Jamestown, N. Y., maker of metal furniture and equipment, has leased 18,000 square feet of floor space at 2901 South LaSalle street, where it will establish warehouse and service operations.

CHICAGO—New City Iron Works plant and unit belonging to the Whelco Laundry Machinery Co. were both recently damaged by fire. Companies are located at Fifty-fourth street and Western avenue. Aggregate loss was approximately $125,000.

EAST ST. LOUIS, ILL.—Wailes Dove-Hermiston Corp., 17 Battery place, New York, has acquired property here for the construction of a plant at an estimated cost of $150,000. Company manufactures special coatings for underground metal structures.

EVANSVILLE, IND.—Louisville & Nashville railroad, H. T. Shanks purchasing agent, Ninth street and Broadway, Louisville, Ky., is building an addition to its shops at Howell, Ind., to house boilers. Estimated cost, $50,000.

GREENSBURG, IND.—Cyclone Fence Co., Waukegan, Ill., will erect a 1-story power house addition here at an estimated cost of $12,000. Plans are private. Contract has been awarded to the Krebay Construction Co., New City Trust building, Indianapolis.

RUSHVILLE, IND.—Mullins-Gilson Mfg. Co., whose plant was recently damaged by fire, has awarded contract to G. C. Bishop for rebuilding a 1-story 45 x 75-foot foundry building. (Noted May 29.)

BELDING, MICH.—Belding Foundry Co., manufacturer of gray iron castings and operator of a machine shop and pattern shop, is making alterations to its plant and adding a new unit.

KALAMAZOO, MICH.—Ramisch Tool & Die Co., Carl T. Ramisch owner, advises that the company will expand and add additional equipment some time in the future, in addition to plant now being built. Company manufactures special tools, dies, and machinery. (Noted June 19.)

NORTHVILLE, MICH.—Board of health, 1300 Beaubien street, Detroit, expects to award contract soon for a 2-story addition to sanitarium here, including boiler house. Estimated cost, $200,000.

OWOSSO, MICH.—H. L. Hartley Machine Co., newly formed organization here, has leased the warehouse of the National Grocer Co. on Corunna avenue and will begin production on machines for polishing stainless steel in about 10 days. Plant will employ 40 men. Advice states plant will be equipped with lathes, milling machines, planers and drill presses among other smaller tools.

ALLIANCE, O.—Kulka Iron & Metal Co. has purchased the plant of the Alliance Aircraft Co. at sale recently. It is understood that the plant will be operated by a new aircraft building company.

CLEVELAND—Herbst Piston Ring Co., care Frank R. Jaffa, 708 Society for Savings building, advises that the company, recently incorporated, will manufacture piston rings.

DAYTON, O.—Joseph C. Keim, 64 East Helena street, has permit for alteration to workshop at above address.

DAYTON, O.—United Aircraft Products Inc., recently incorporated as successor to National Aircraft Products Co., has purchased site and buildings here and is reported expanding facilities. Company manufactures aircraft engines, fittings, accessories and instruments.

DAYTON, O.—Constructing quartermaster, Captain L. M. Doten, closes bids July 12 for a group of buildings to be constructed at Wright field including radio laboratory, maintenance unit, armament laboratory and foundry. (Noted May 29.)

MARTINS FERRY, O.—Wheeling Steel Corp., Wheeling, W. Va., is reported planning construction of a storage house and shipping floor in connection with its works here.

SIDNEY O.—Central Radial Drill Co., care R. B. Busch, 3619 Davenant road, Cincinnati, is reported to plan a 1-story plant here on a site adjoining Big Four railroad property. Estimated cost, $40,000. Private plans.

TIFFIN, O.—Monarch Mfg. Co. was recently reported installing new machinery for the production of a new line of metal products. Production will be under way by midsummer. Company manufactures wash boards.

WESTERVILLE, O.—Kilgore Mfg. Co., manufacturer of toy revolvers, has awarded contract to R. O. Karg for a 1-story, 60 x 60-foot plant addition to cost approximately $10,000.

YOUNGSTOWN, O.—United States Gypsum Co., 300 West Adams street, Chicago, is reported to be investigating plant sites here. Company may erect a plant for the manufacture of steel building materials.

MILWAUKEE—Bentley Bros. Inc., contractor, has the contract for a 1-story addition 80 x 80 feet, to the erecting shop of the Nordberg Mfg. Co., E. C. Bayerlein vice president, Oklahoma and Chase avenues.

MILWAUKEE—Regents, State Teachers' colleges, 845 Downer avenue, have appropriated $330,000 for a new heating plant and gymnasium to be built at the Milwaukee college, Frank E. Baker president.

MILWAUKEE—Frank F. Drolshagen, 447 Virginia street, architect, is drawing plans for an undisclosed client for a shop building, 78 x 225 feet, at Thirty-fifth and National avenues. Bids will be taken at once. One 5-ton crane and other machinery will be installed, according to advice.

MILWAUKEE—S. Heller Elevator Co., 250 Milwaukee street, builder of freight and passenger lifts, has plans by W. Fred Dolke Jr., consulting engineer, 9 South Clinton street, Chicago, for alterations and remodeling of its shop building at 244 Milwaukee street.

MILWAUKEE—Chicago & North Western railroad, E. A. Clifford, general purchasing agent, 400 West Madison street, Chcago, has let the general contract to John S. Metcalf Co., 111 West Jackson boulevard, Chicago, for building an addition, 108 x 310 feet, to the Kinnickinnic elevator and workhouse, Greenfield avenue. Addition will cost about $500,000, including additional machinery, motors and other equipment.

PORT WASHINGTON, WIS.—Board of education, John E. Gilson president, plans a high school with vocational classrooms and shops, to be erected at an approximate cost of $150,000. Foeller, Schober & Berners, 302 Pine street, Green Bay, Wis., are preparing plans.

RACINE, WIS.—Modine Mfg. Co., maker of radiators and internal combustion engines, proposes plant and production expansion soon. The company recently spent $50,000 for machinery and further enlargement is now contemplated, although plans are indefinite, according to advice.

RICE LAKE, WIS.—Municipal airport to be constructed here will include 14 x 30-foot workshop and 50 x 50-foot hangar.

SHEBOYGAN, WIS.—Rudolph R. Jahn, city building inspector, is drawing plans for an

Sales Calendar

June 27—Receivers' sale of entire assets of Elliott-Blair Steel Co., New Castle and Mercer, Pa.

July 8-9—Liquidation auction sale of real estate, machinery and equipment of H. G. Trout Co., Buffalo.

addition to the city tool house and service building. Estimated cost is $25,000. One 3-ton electric hoist will be required, among other equipment. Erwin Mohr is city clerk.

SOUTH MILWAUKEE, WIS.—Bucyrus-Erie Co., Eleventh and Monroe streets, will build a 2-story laboratory building here at an estimated cost of $40,000. F. D. Chase Inc., 720 North Michigan avenue, Chicago, is engineer, and the contract has been let to P. Riesens Sons, 1022 Humboldt avenue, Milwaukee. Revised plans have been drawn.

North Atlantic

HARTFORD, CONN.—Bush Mfg. Co., 100 Wellington street, has awarded contract for construction of a plant for manufacture of airplane radiators. Estimated cost, $40,000.

HARTFORD, CONN.—Hartford Electric Light Co., 266 Pearl street, has awarded contract to Stone & Webster Inc., 49 Federal street, Boston, for construction of a mercury boiler plant extension and a steel outdoor substation. Total cost will approximate $300,000.

WASHINGTON—A. L. Flint, general purchasing officer, Panama Canal, Washington, receives bids until July 7 for two 35-horsepower diesel engines for ferry boat installation.

BALTIMORE—Maryland Brass & Metal Works, Federal and Calvert streets, maker of brass, copper and aluminum castings, is building a 1-story, 50 x 200-foot plant at Rosedale station, here. William Gistriel Jr. is manager. Maryland Metal Building Co., McComas and Race streets, has the contract.

LOCK HAVEN, MD.—Maryland Training School for Boys has awarded contract for an educational and vocational building here to Davis Construction Co., 9 West Chase street, Baltimore. Building will cost approximately $175,000, and will be 133 x 192 feet.

BOSTON—Charlestown navy yard is installing one 1000 horsepower boiler and settings.

BOSTON—Vulcan Tool Mfg. Co., 41 Liberty street, has awarded contract for plant additions and alterations to Clark & Smith Inc., 13 Temple street.

BRIGHTON, MASS.—Commonwealth Garage, Brighton avenue, will soon receive bids for reconstruction of its repair shop and service station at Brighton and Lindon street. W. F. Bryant & Son, 334 Washington street, Brookline, Mass., are engineers. Estimated cost, $40,000.

CAMBRIDGE, MASS.—Lubrair Corp., recently formed here, will manufacture high pressure grease guns for automobile lubrication. Company employs ten people.

SOMERVILLE, MASS. — Somerville Auto Body Co., 643 Broadway, has awarded contract for construction of shop on Boston avenue at an estimated cost of $40,000. Plant is to be 1-story, 50 x 100 feet.

SOUTHBRIDGE, MASS.—American Optical Co., 110 Tremont street, Boston, is making alterations to its plant here to take care of departmental expansion. Company manufactures optical machinery.

SOUTH EVERETT, MASS.—Merrimac Chemical Co. has awarded contract for a locker building in reconstruction program to John F. Griffin Co., contractor, 100 Arlington street, at an approximate cost of $40,000. (Noted April 24.)

WESTFIELD, MASS.—Ryan Valve Co. has begun production in a portion of the Ensign A. E. Box Co. plant. Company manufactures safety valves.

DOVER, N. J.—War department, Washington, plans construction of a power house and other buildings at Picatinny arsenal here, at an estimated cost of over $450,000.

NEWARK, N. J.—Flakeice Co., 205 Water street, Brooklyn, has leased a 1-story plant in the group at 574 Ferry street from the Bassick Co., a division of the Stewart-Warner Co., for operation in connection with the Brooklyn plant of the Flakeice Co.

NEWARK, N. J.—Hoffman LaRoche Inc., Kingsland road, has awarded contracts for a 1-story, 75 x 108-foot plant and a 5-story, 35 x 65-foot plant on Kingsland road to J. W. Ferguson Co., 152 Market street, Paterson, N. J. Estimated cost, $65,000. Company manufactures chemicals.

BROOKLYN, N. Y.—Long Island College hospital, Henry and Pacific streets, will build a power house and boiler room, 45 x 100 feet. Estimated cost, over $40,000. W. Higginson, 101 Park avenue, New York, has plans.

BUFFALO—S. B. Whistler & Sons Inc., 1459 Niagara street, has awarded contract to J. Klein, 39 Vulcan street, for construction of a 1-story plant estimated to cost $30,000. Company manufactures dies and tools.

ELLICOTTVILLE, N. Y.—Guenther Mfg. Co., 1281 Jefferson avenue, Buffalo, will erect a 1-story plant here at a cost over $30,000. Company manufactures radiators.

NEW YORK—Rialto Metal Spinning & Stamping Co., incorporation of which was recently noted, is locating plant at 195 Wooster street. (Noted June 19.)

NEW YORK—Central Foundry Co., 420 Lexington avenue, subsidiary of Universal Pipe & Radiator Co., has awarded contract for construction of a foundry at an estimated cost of over $40,000. Plant is to be located between East 140th and 144th streets.

NEW YORK—Haiss Mfg. Co., 391 Canal place, manufacturer of elevating and conveying machinery, has awarded contract to P. Roth & Son, 1738 Mahan avenue, for a 1-story plant at East 141st street and Park avenue. Estimated cost $20,000.

NIAGARA FALLS, N. Y.—Eugene F. Nutting, Forest road, has applied for a building permit to erect a 1-story, 50 x 50-foot plant at Highland and Virginia avenues for plating automotive parts.

GREENVILLE, PA.—Adalet Mfg. Co., 4610 St. Clair avenue, Cleveland, manufacturer of electrical products, advises merger is pending with Continental Steel Products Co., Youngstown, O., and that erection of a plant here is a possibility although plans are immature at present.

MEADVILLE, PA.—Fire completely destroyed the idle plant of the Jones Foundry Co., 301 Pine street. William Jones is owner of the buildings.

PHILADELPHIA—Pennsylvania railroad, T. J. Skillman chief engineer, Broad street station, has awarded contract for a 1-story blacksmith and machine shop, 72 x 150 feet, to George A. Fuller Co., Morris building. Estimated cost $63,000.

PHILADELPHIA—Midvale Co., Nicetown, manufacturer of iron and steel, subsidiary of the Baldwin Locomotive Works, has building permit for a laboratory and office unit costing approximately $65,000 to be located at Roberts avenue and Blabon street. United Engineers & Constructors Inc., 112 North Broad street, has the contract.

WESTERLY, R. I.—Joseph S. Santin, Mystic, Conn., will erect a combined shop and hangar here at Atlantic airport.

Southern States

PENSACOLA, FLA.—Pensacola Metal Aircraft Corp. proposes establishing a plant for the manufacture of airplanes. P. L. Pierce, American National Bank building, is an officer.

ST. PETERSBURG, FLA.—Florida Fishing Tackle Co., 1930 First avenue south, will move its manufacutring plant and machinery to the Norton Furniture Co. building, 2100 First avenue south, where it will occupy 17,500 square feet of space.

LOUISVILLE, KY.—Tube Turns Inc., manufacturer of pipe-bending machinery, is completing additions to plant, expenditure with equipment to amount to over $30,000.

LAREDO, TEX.—Swift & Co., care G. Getz, Robert E. Lee hotel, is taking bids on the construction of a plant at Neuvo Laredo, Mexico. Plans include canmaking department, boiler

(*Continued on Page* 101)

Machinery

Outlook After Poor Second Quarter Points to Slack Summer—Buying Mostly Odds and Ends—School Equipment to Be Placed Soon

RESTRICTED buying of all types of machinery continues with inquiries light and dealers not counting on much business until fall. After a decidedly poor second quarter the outlook is not much improved, buying by automotive interests being uncertain and the railroads still holding off purchases. The opinion has been expressed that the coming railroad equipment show in the East may stimulate buying. Machinery for equipping the machine shops of several new schools in the Chicago district probably will be bought within the next two weeks. Inquiries from steel companies are few and prospects for substantial buying in the near future are not bright. Inquiries for used tools are fair but scattered. Some export business in grinders is being transacted.

New York, June 24.—Machine tool buying shows little if any improvement. Most dealers and builders expect little volume before fall. Sales are confined to one or two units at a time while inquiry is light with little business up for figures. Practically all types of equipment are included, although a fair volume of electrical equipment is moving. Production schedules have in some instances been reduced and working forces placed on a skeleton basis. Builders stocked a few standard tools, but not heavily. Deliveries are prompt and improvement is also noted on boring equipment.

The government continues to inquire for and buy a few tools and some school tools are listed for early action. Grinding tools are moving slowly with the outlook for the automobile industry taking much machinery during the next quarter uncertain. A Connecticut bearing maker, operating overtime for some weeks, has gone back to regular schedule.

Worcester, Mass., June 24.—All lines in the machinery market report business quiet. Grinders are doing some business abroad with Russia but the domestic market is inactive. No active inquiry is in the market for either lathes or milling machines save for an occasional order for a single unit throughout New England. Prospects for any upward trend before fall seem remote.

Pittsburgh, June 24.—Machine tool activity again has quieted with the market remaining slow in new inquiry. Railroad buying, which has been light since the first of the year, is expected to improve shortly following the railroad equipment show at Atlantic City, N. J. Several inquiries are in prospect for railroads in this district. Inquiry from steel companies is only moderate with prospects poor for substantial buying in the near future. Most recent awards involve only individual tools.

Chicago, June 24.—Odd and ends buying largely represents machine tool sales activity, while the absence of important inquiries is felt more sharply. Because of the meager inquiry prospects much uncertainty prevails as to July and August. In general, June sales will measure up fairly well with May, but will be far behind March and April. Chicago, St. Paul, Minneapolis & Omaha railroad is inquiring for a 24-inch drill press, 24-inch lathe and motor-driven grinder, and Rock Island has just placed a horizontal drilling and milling machine. Union Pacific also purchased a forging machine in this market. Several lathes have been closed with Lake Superior iron ore interests, and orders were closed for several radial drills in the Chicago area. It is not expected that Chicago board of education will order its equipment for the new Austin High school before July 9. The board is inquiring for two 11 x 4 lathes, motor-driven dry grinders and sensitive drills for New Wright and New Amundsen junior high schools. Fair scattered inquiry continues for used tools.

Cleveland, June 24.—Machinery trading continues at low ebb although dealers are kept busy furnishing quotations. Plans for re-equipping and retooling programs are numerous but they progress no further than the plan stage in most cases. Used machinery is exceptionally quiet. A turret lathe builder continues on the three-day week schedule, although reporting that a slight uptrend is noted. The second quarter for most interests has been a poor one, one dealer stating that his business was about on a par with 1921 and 1922, lean years for machinery people. With the vacation season at hand no appreciable betterment can be expected and the opinion is that it will be September before orders may resume a normal plane.

Machinery Tariff Found Confusing in Canada

Confusion arising from new tariff regulations on imported machinery has been the cause for much worry on the part of Canadian machinery dealers. The new tariff calls for free entry from Great Britain of all machinery which has no counterpart made in Canada, and 20 per cent levied on machinery entering from the United States under like circumstances. Duties on types of machinery already being made in Canada specify 15 per cent on such machinery entering from Great Britain and 30 per cent if entering from United States.

However, the importer must pay the full rate and then apply to Ottawa for a rebate on those types which he believes are not manufactured in Canada. This procedure involves a delay of some three months and in the meantime the importer does not know what duties he will be compelled to pay on the machinery; consequently he is unable to quote final prices to the buyer. Canadian machinery importers have found this a sore spot in their trade, according to W. H. Petrie, mahinery importer of Toronto, Ont.

May Hoist Orders Drop

New York. June 24.—Members of the Electric Hoist Manufacturers' association report the number of hoists ordered during May decreased 21.9 per cent as compared with the previous month, and the value of such orders decreased 18.638 per cent. Shipments were 6.954 per cent lower in May than in April.

Casting Orders Down

Washington, June 24.—Bookings of steel castings in May were 89,687 tons, or 62 per cent of capacity. This compares with new orders at 64 per cent in April, or 92,966 tons. May production also shrank, although 5-month totals in this classification are as high in 1930 as in 1929. Department of commerce statistics follow:

	——Bookings——		——Production——	
1929	Total net tons	†Railway specialties	Total net tons	†Railway specialties
May	113,329	44,919	127,189	58,636
Total (5 mos.)	628,733	304,999	553,274	237,627
June	95,201	34,947	116,221	54,154
July	103,356	37,731	118,100	51,989
Aug.	101,777	38,986	121,238	53,328
Sept.	86,584	33,463	106,995	44,609
Oct.	136,208	72,432	120,937	50,102
Nov.	97,888	41,361	110,297	49,994
Dec.	90,287	33,980	106,569	34,667
Total (year)	1,340,034	597,899	1,355,631	576,470
1930				
Jan.	101,728	42,502	109,296	44,292
Feb.	114,727	55,310	107,897	44,652
March	122,658	54,063	113,737	47,813
April *	92,966	35,213	111,366	45,909
May**	89,687	41,252	103,405	42,317
Total (5 mos.)	521,766	228,340	545,701	228,483

*Revised.
**Preliminary.
†For tonnage of miscellaneous castings deduct railway specialties from the total.

The first large steelworks to use electric cranes throughout the plant was the Homestead works of the Carnegie Steel Co. This was in 1893.

Construction and Enterprise

(*Continued from Page 99*)

and engine room. Estimated cost, $100,000. Private plans.

Canada

VANCOUVER, B. C.—City council will soon call for tenders for construction of a land and seaplane hangar, and a machine shop at the local airport. Plans are being prepared.

LONDON, ONT.—Richards-Wilcox Can Co. Ltd., Chelsea Green, William R. Yendall manager, is taking bids for the construction of a 1-story, 80 x 100-foot addition to its plant. Estimated cost $40,000. Watt & Blackwell, 286 Dundas street, are architects.

Western States

PHOENIX, ARIZ.—Plant of Monty's Radiator & Welding Works, North Fifth street was recently damaged by fire, loss approximating $8000.

PHOENIX, ARIZ.—Board of Public Works is reported to be planning improvements to the municipal waterworks, including installation of pumping machinery and auxiliary equipment. W. J. Jamieson is city engineer.

COMPTON, CALIF.—H. K. Homer, 401 East Los Angeles street, Long Beach, Calif., has contract to build a 1-story, 50 x 80-foot plant for the Gregg Steel Products Co., here.

PITTSBURG, CALIF.—Stockton Fire Brick Co., Russ building, San Francisco, has plans in preparation for construction of first unit of a refractories plant here. Machinery and equipment, including conveyors, will be installed. Estimated cost, $500,000. Private plans.

RICHMOND, CALIF.—Ford Motor Co., Fordson, Mich., asked bids June 23 on the general contract for an assembly plant here, expected to cost over $2,000,000. Tract was acquired and plans have been reported in progress for some time. (Noted Jan. 16.)

WHITEFISH, MONT.—Great Northern railway, Jackson and Fourteenth streets, St. Paul, is reported to have plans for a power plant to be constructed here. Estimated cost, $50,000.

BEAVER, UTAH—American Smelting & Refining Co., A. H. Means manager, McCormick building, Salt Lake City, Utah, is reported to plan the purchase of equipment for its Frisco-Lulu mine, near here, including an electric hoist, head frame and foundations, and a 370-foot compressor.

SEATTLE—Albatross Steel Equipment, 10075 Grand street, Los Angeles, will establish an assembly plant here and transfer operations from its Los Angeles plant. R. G. E. Cornish is president.

SEATTLE—General Illuminating Co., manufacturer of illuminated signs, has begun reconstruction of its plant at 1530 North Westlake avenue, which was recently damaged by fire. An addition, 50 x 50 feet, will also be erected.

West Central

TOPEKA, KANS.—Kansas Power & Light Co. will build a 1-story power substation here at an estimated cost of $40,000. R. Scammell, 1000 Kansas avenue, is architect and R. Finney, New England building, is engineer.

MINNEAPOLIS—Baker Iron Co., 1724 East Franklin avenue, is reported planning a 1 and 2-story plant on Hiawatha avenue. Pike & Cook, 416 South Fifth street, have contract.

MINNEAPOLIS—Caterpillar Tractor Co., Peoria, Ill., has closed bids for the construction of a 1-story branch plant at 2601 University avenue. Estimated cost, $200,000. Austin Co., 510 North Dearborn street, Chicago, is architect and engineer.

KANSAS CITY, MO.—Welded Products Corp., A. G. Saeger president, Seventeenth and Cleveland avenues, will build a plant on a site recently purchased south of Independence avenue, Topping to White avenues. Fred Michaelis, 114 West Tenth street, is reported to be the architect.

ST. LOUIS—American Car & Foundry Co. will erect two paint shops here, one 160 x 680 feet, a second, 50 x 60 feet, as additions to its plant at 2800 DeKalb street. Capital investment, $320,000.

OMAHA, NEBR.—G. Borger, clerk, has awarded contract to R. Butke, Paxton building, for a 50 x 142-foot power house on Maple street.

Recent Incorporations

WILMINGTON, DEL.—Milcor Steel Co. has been incorporated with 100,000 common shares by Delaware Registration Trust Co., Industrial Trust building, to deal in metals and ores.

CHICAGO—Svebilius Mfg. Co. has been incorporated with 250 no par shares by Arnold Svebilius, 614 North Union avenue, to operate a general machine shop.

PEORIA, ILL.—J. W. Field Mfg. Corp. has been incorporated with $50,000 capital by J. W. Field, 1028 South Adams street, to deal in vending machines and paper products.

COVINGTON, KY.—S. & S. Metal Products Co. has been incorporated with $36,000 capital by A. E. Clifton, 4431 Carnation avenue, Cincinnati, to manufacture and sell machinery, furnaces and other metal products.

ALGONAC, MICH.—Chris-Craft Corp. has been incorporated with 225,000 no par shares by Chris C. Smith, to build and repair water craft.

CARSON CITY, MICH.—Wright Manufacturing Co. has been incorporated with $100,000 capital by Fred A. Wright to manufacture wood and metal articles.

CHARLOTTE, MICH.—Martin Laboratories Inc. has been incorporated with $25,000 capital by Vine B. Peters to manufacture mechanical devices.

DETROIT—Taylor Detroit Mfg. Co. has been incorporated with $100,000 capital by Howard C. Taylor, 3386 Mack street, to manufacture and deal in automobile parts and accessories.

GRAND RAPIDS, MICH.—Econo-Meter Co. has been incorporated with 5000 no par shares by George D. Wilcox, 914 Grand Rapids Trust building, to manufacture and deal in steel, copper and iron articles.

MONROE, MICH.—Monroe Sheet Metal Co. has been incorporated with $10,000 capital by Fred J. Routledge, 901 South Monroe street, to manufacture automobile accessories.

ASBURY PARK, N. J.—Forge Carburetor Co. Inc. has been incorporated with $100,000 capital to manufacture mechanical devices.

HAWTHORNE, N. J.—John Vandenberg & Sons Inc., has been incorporated with $125,000 capital by Frederick W. Van Blarcom, 140 Market street, Paterson, N. J., to deal in auto bodies.

HOBOKEN, N. J.—Hoboken Iron Works has been incorporated with $23,000 capital by Horace L. Allen, 84 Washington street, Newark, N. J., to deal in ornamental iron.

BROOKLYN, N. Y.—Franklin Knitting Machinery Co. has been incorporated with $20,000 capital by S. W. Aronson, 11 Park place, New York.

BROOKLYN, N. Y.—Bedford Specialty Corp. has been incorporated with $10,000 capital by Morris Honig, 26 Court street to operate a machine shop.

JAMESTOWN, N. Y.—Corry Metal Corp. has been incorporated with 500 common shares by Jackson, Herrick, Durkin & Leet, Hotel Jamestown building, to make metal furniture.

NEW YORK—Star Block & Die Co. has been incorporated with $20,000 capital by N. Siegel, 261 Broadway, to deal in metal dies.

NEW YORK—John A. Hense & Associates have been incorporated with 100 common shares

by R. Guthman, 331 Fourth avenue, to operate a machine shop.

NEW YORK—Shields Cutter Co. has been incorporated with $5000 capital by C. R. Williams, 256 Broadway, to deal in machinery.

NEW YORK—Schweibish Bros. Co. has been incorporated with 200 common shares by S. R. Kurzman, 18 East Forty-first street, to deal in iron and steel products.

NEW YORK—Lewis & Egginton have been incorporated with 100 common shares by J. M. Hanley, 63 Wall street, to operate a brass and iron foundry.

NEW YORK—Spirolectric Mfg. Co. has been incorporated with $10,000 capital by F. & J. Weiss, 350 Madison avenue, to manufacture radio accessories.

CINCINNATI—General Range Mfg. Co. has been incorporated with 100 no par shares by George E. Smith, 2249 Beechmont avenue, Mount Washington, O.

CINCINNATI—Standard Castings of Cincinnati Inc. has been incorporated with $35,000 and 330 no par shares capital by Wood, Marx & Ginter, 900 Traction building.

CLEVELAND—U. S. Electric Swivel Co. has been incorporated with 250 no par shares by W. M. Sharp, 850 Euclid avenue, to manufacture electric swivels.

COLUMBUS, O.—Central Ohio Welding Co. has been incorporated with 500 shares no par value by J. G. Kahle, 33 North High St.

TOLEDO, O.—Toledo Plating Works Inc. has been incorporated with 250 no par shares by Rowe, Williams & Dillon, Security Bank building.

TOLEDO, O.—Schultz Die Casting Co. has been incorporated by J. A. Schultz, care Doehler Die Castings Co., Prospect and Smead streets, to manufacture and deal in dies, castings and machinery.

WARREN, O.—Lenney Machine & Mfg. Co. has been incorporated with 100 no par shares by W. B. Kilpatrick, Second National Bank building to manufacture, repair, and deal in machinery.

WARREN, O.—Van Huffel Tube Corp. has been incorporated with 3000 no par shares by I. J. Van Huffel and Arden O. Lea, to manufacture and deal in tubes of all kinds, machinery equipment and accessories required in their manufacture.

OKLAHOMA CITY, OKLA.—Capitol Iron & Metal Co. has been incorporated with $5000 capital by R. Finkelstein, 1208 South Robinson street, to deal in old metals.

PONCA CITY, OKLA.—Nickles Machine Shop has been incorporated with $25,000 capital by C. A. Nickles, 208 South First street.

COATESVILLE, PA.—Lukenweld Inc. has been incorporated with 250 no par shares by Charles E. Kenworthy, Polo road and Kenworthy avenue, Bryn Mawr, Pa., to manufacture iron and steel articles.

HANOVER, PA.—Moul-Hesson Corp. has been incorporated with $5000 capital by A. G. Moul, to manufacture and deal in canning machinery and heating appliances.

LANCASTER, PA.—Herco Oil-Burner Corp. has been incorporated with 3000 no par shares by Frank R. Herr, 230 East Orange street, to manufacture and sell oil burners, novelties, castings, stampings, electrical and mechanical devices, machinery and equipment.

PHILADELPHIA—Acme Brass & Bronze Foundry Inc. has been incorporated with $50,000 capital by Anthony H. Scherer, 6313 Bingham street, to manufacture castings and machine products.

PHILADELPHIA—Tioga Engineers have been incorporated with $5000 by Stephen H. DeCoursey, 427 West Hortter street, to manufacture, repair, and deal in boilers, engines and machinery and their accessories.

PHILADELPHIA—United Supply & Mfg. Co. has been incorporated with $10,000 capital by Norman J. Keely, 133 Oakley road, Highland park, Delaware county, Pa., to manufacture and deal in plumbing supplies, specialties, metal and rubber appliances.

PITTSBURGH—Fort Pitt Stoker Co. has been incorporated with $5000 and 5000 no par shares by Lawrence V. Stevens, 265 Lebanon avenue, Mt. Lebanon, Pa., to manufacture and deal in stokers and other appliances.

HOUSTON, TEX.—Gulf Tractor & Equipment Co. has been incorporated with $45,500 capital by S. P. Farnish, Humble building.

New Trade Publications

AUTOMATIC LATHE—National Acme Co., Cleveland, describes in a current leaflet its 4-spindle automatic for heavy duty. Illustrations show details and the device is fully explained.

STEEL CASTINGS—Lebanon Steel Foundry, Lebanon, Pa., in a current bulletin, stresses the degree of safety its steel castings give to transportation units.

RIVETERS—Hanna Engineering Works, Chicago, has issued a bulletin to stress the dependability of riveting as applied to built-up assemblies of various kinds.

INDUCTION MOTORS—Reliance Electric & Engineering Co., Cleveland, has published a bulletin on its fully enclosed fan-cooled induction motors with ball bearings. Details of construction and engineering data are included.

HEAT-TREATING FURNACES—High-temperature gas-fired heat treating units are featured in a bulletin by Heat Engineers Inc., Buffalo. Features of its units are described and advantages cited.

WIRE TABLES—Tables of strength of its copper welded wire have been published by the Copperweld Steel Co., Glassport, Pa. The tables show breaking strength in pounds of various types of wire, loading tables for cables.

PNEUMATIC TOOLS—Chicago Pneumatic Tool Co., New York, in a current bulletin describes and illustrates its demolition tools and sheeting driver. Illustrations show the various types of tools at actual work.

STANDARD STEEL BUILDINGS—Genfire Steel Co., Youngstown, O., announces in a current leaflet its entry into the field of standardized steel buildings, illustrating some of the types it has to offer.

OXYGEN SHAPE CUTTERS—General Welding & Equipment Co., Boston, illustrates in a current bulletin its oxy-gas automatic shape-cutting machines for mass production. Illustrations show method of use and character of work produced.

ELECTRIC MOTORS—Wagner Electric Corp., St. Louis, has published a bulletin on its motors, discussing power factor and its correction, with curves and illustrations. Construction details and applications of the motor are covered. Control equipment is described.

ELECTRIC STEEL—Electric steel produced in an induction furnace is treated in a bulletin by the Heppenstall Co., Pittsburgh. The subject of steels produced in this type of furnace is discussed at length and illustrations show the furnaces and their operation.

AIR COMPRESSORS—Westinghouse Traction Brake Co., Pittsburgh, has issued two bulletins on motor-driven air compressors of various types. They are illustrated and descriptive matter goes into the subject of construction and application. Tables cover dimensions, capacities and other data.

SHEET METAL MACHINE—Peck, Stow & Wilcox Co., Southington, Conn., describes in a current bulletin its motor-driven rotary machine for burring, turning, wiring, edging, crimping and performing other operations on sheet metal. The machine and accessories are illustrated.

CRANES—Northern Engineering Works, Detroit, has issued a catalog of its cranes in a looseleaf binder. It covers the entire line and is illustrated to show the mechanism and various features of construction. The catalog contains numerous bulletins bearing on the use of cranes for a variety of purposes.

SCREW CONVEYOR DRIVES—Link-Belt Co., Chicago, has compiled a book describing its line of screw conveyor drives built by H. W. Caldwell & Son Co., Chicago, a subsidiary. Illustrations show the drives and typical installations. Engineering data are appended, enabling selection of the most suitable drive for a given installation.

SCOTTISH TRADE—*Scottish Trade Courier*, Merchants House Buildings, 30 George square, Glasgow, Scotland, has issued its directory of manufacturers and traders interested in foreign business. It covers engineering, shipbuilding, machinery, metal and allied trades. Firms are arranged in classifications with information making access easy.

GRILLE FRAMES—Harrington & King Perforating Co., Chicago, is producing a new device for framing metal grilles, which is described in a current catalog. The sides and corners are stock, the former to be cut to any size and the whole assembled by screws about the metal grille, which can be cut from stock size. The catalog shows methods of assembly.

SPEED REDUCERS—A leaflet describing two of its speed reducers has been issued by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. They are built with single helical gears, anti-friction bearings and splash lubrication. They are equipped for single and double reduction. Data cover horsepower ratings, speeds, dimensions and weights, accompanied by outline drawings.

ALLOY STEELS—Reducing transportation costs by means of engine design is the subject of a reprinted paper being distributed by the International Nickel Co., New York. The paper was presented before the Society of Automotive Engineers by E. J. Hall, vice president in charge of engineering of the Hall-Scott Motor Car Co., Berkeley, Calif. It deals with motor bus engines and emphasizes the important part which alloy steels and other high-grade materials play in proper design.

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Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE
Air Reduction Sales Co., 60 E. 42nd St., New York City.
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Air Reduction Sales Co., 60 E. 42nd St., New York City.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

AIR COMPRESSORS — See COMPRESSORS (Air)

ALLOYS—See FERROALLOYS

ALLOYS (Strong Aluminum)
Aluminum Co. of America, 2408 Oliver Bldg., Pittsburgh.

ALUMINUM
Aluminum Co. of America, 2408 Oliver Bldg., Pittsburgh.

ALUMINUM (Tubing)
Summerill Tubing Co., Bridgeport, Pa.

ALUMINUM BRONZE (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

ALUMINUM BRONZE POWDER
Aluminum Co. of America, 2408 Oliver Bldg., Pittsburgh.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Petroleum Iron Works Co., The, Sharon, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

ANVILS (Cast Steel)
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

ARCHES (Suspended)
Detrick, M. H., Co., 140 S. Dearborn St., Chicago, Ill.

ARCHITECTS (Industrial)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Williams Alloy Products Co., The, Elyria, Ohio.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BANDS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.

BARS (Concrete Reinforcing)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Franklin Steel Works, Franklin, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
McClinitc-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

BARS (Iron)—See IRON (Bar)

BARS (Manganese Steel)
Taylor Wharton Iron & Steel Co., Easton, Pa.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BEADING, SEAMING & WIRING MACHINERY
Quickwork Co., The, St. Mary's, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
McClintic-Marshall Steel Supply Co., Oliver Bldg., Pittsburgh, Pa.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

BEARING METAL
Hills-McCanna Co., 2349 Nelson St., Chicago, Ill.
Williams Alloy Products Co., The, Elyria, Ohio.

BEARINGS (Ball)
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Hyatt Roller Bearing Co., Harrison, N. J.
Timken Roller Bearing Co., The, Canton, O.
Williams Alloy Products Co., The, Elyria, Ohio.

BEARINGS (Motor)
Hyatt Roller Bearing Co., Harrison, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Roller)
Hyatt Roller Bearing Co., Harrison, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, Trenton, N. J.

BEARINGS (Thrust)
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS AND BUSHINGS (Brass and Bronze)
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Erie Bronze Co., 402 W. 19th St., Erie, Pa.
Williams Alloy Products Co., The, Elyria, Ohio.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., The, 1301 Koppers Bldg., Pittsburgh.

BILLET GOUGERS AND PEELERS
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.

BILLETS (Alloy and Carbon Steel)
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Erie Forge Co., Erie, Pa.
Heppenstall Co., 47th and Hatfield, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Illinois Steel Co., 208 South La Salle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.

BILLETS AND SLABS
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., Magee Bldg., Pittsburgh, Pa.
Brosius, Edgar E., Inc., Sharpsburg P. O., Pittsburgh, Pa.

BLAST FURNACES — See FURNACES (Blast)

BLOWERS
Coppus Engineering Co., Park Ave., Worcester, Mass.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.

BLOW PIPES (Brazing, Welding Cutting, Etc.)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

LEWIS
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For Iron, Steel, Brass, Copper, Aluminum, Zinc and Nickel.

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For Cold Sheets, Tin Plate and Strip.

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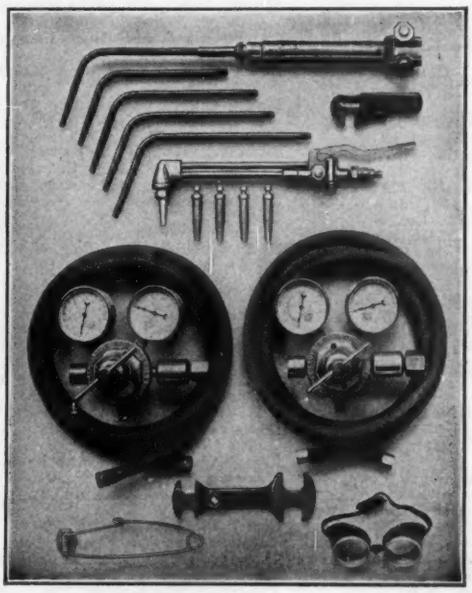
CORPORATION
PITTSBURGH, PA.

An Airco-Davis-Bournonville Combination Welding and Cutting Outfit No. 8888



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Charlotte, N. C.	Jersey City		Philadelphia	
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88 Plants 25 District Offices

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Rust Engineering Co.,
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BOILER TUBES—See TUBES (Boiler)

BOILERS
Babcock & Wilcox Co., The,
85 Liberty St., New York City.

BOLT AND NUT MACHINERY
Landis Machine Co.,
Waynesboro, Pa.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Lamson & Sessions Co., The,
2188 Scranton Rd., Cleveland, O.
Neely Nut & Bolt Co.,
2101 Wharton St., Pittsburgh.
Oliver Iron & Steel Corp., S. 10th and Muriel Sts., Pittsburgh.
Pittsburgh Screw & Bolt Co.,
Preble Ave., Pittsburgh, Pa.
Republic Steel Corp.,
Youngstown, Ohio.
Rockford Bolt Co.,
220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell St., Chicago.
Wrought Iron Co. of America,
Lebanon, Pa.

BOOKS (Technical)
Penton Publishing Co., Cleveland.

BOXES (Carbonizing)
Driver-Harris Co., Harrison, N. J.
Farrell-Cheek Steel Foundry Co.,
Sandusky, O.

BOXES (Open Hearth Charging)
Strong Steel Foundry Co.,
33 Norris St., Buffalo, N. Y.

BRAKES (Press)
Cincinnati Shaper Co., Cincinnati.
Clark Controller Co., The,
1146 E. 152nd St., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co.,
2698 E. 79th St., Cleveland, O.

BRICK (Insulating) — See INSULATING BRICK

BRICK (Refractory) — See REFRACTORIES

BRIDGE CRANES (Ore and Coal Handling)
Wellman Engineering Co.,
7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia.
Eichleay, John, Jr., Co., S. 20th and Wharton, Pittsburgh, Pa.
Clinton Bridge Works, Clinton, Ia.
McClintic-Marshall Co.,
Oliver Bldg., Pittsburgh, Pa.
Morgan Engineering Co.,
Alliance, Ohio.
Phoenix Bridge Co., 20 S. 15th St., Philadelphia, Pa.
Pittsburgh Bridge & Iron Works,
Fulton Bldg., Pittsburgh, Pa.

BRONZE (Centrifugally Cast)
Shenango-Penn Mold Co.,
Oliver Bldg., Pittsburgh, Pa.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh.
Brosius, Edgar E., Inc.,
Sharpsburg P. O., Pittsburgh, Pa.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Milwaukee Electric Crane & Hoist Corp., 60th & Greenfield Ave., Milwaukee, Wis.
Owen Bucket Co., The, 6013 Breakwater Ave., Cleveland, O.

BUCKETS (Dumping)
Atlas Car & Mfg. Co.,
1140 Ivanhoe Rd., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co.,
35-43 Dundaff St., Carbondale, Pa.

BUILDINGS (Industrial)
Austin Co., The,
16112 Euclid Ave., Cleveland, O.
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

BUILDINGS (Steel)—See BRIDGES, ETC.

BULLDOZERS
Beatty Machine & Mfg. Co.,
Hammond, Ind.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.

BURNERS (Acetylene)—See TORCHES AND BURNERS

BURNERS (Automatically Regulated)
American Heat Economy Bureau, Inc., Wabash Bldg., Pittsburgh.

BURNERS (Fuel, Oil, Gas, Combination)
Babcock & Wilcox Co.,
85 Liberty St., New York City.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland.
Surface Combustion Co.,
2375 Dorr St., Toledo, Ohio.

BY-PRODUCT PLANTS
Koppers Construction Co., The,
1301 Koppers Bldg., Pittsburgh.

CAN MAKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.

CAP SCREWS — See SCREWS (Cap and Set)

CARBON BURNING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

CARBURIZING COMPOUND
American Cyanamid Co.,
535-5th Ave., New York City.

CAR DUMPERS
Wellman Engineering Co.,
7000 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Easton Car & Construction Co.,
10 E. 40th St., New York City.

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Easton Car & Construction Co.,
10 E. 40th St., New York City.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Duriron Co., Inc., The, Dayton, O.
Hills-McCanna Co.,
2349 Nelson St., Chicago, Ill.
National Alloy Steel Co.,
Blawnox, Pa.

CASTINGS (Alloy Steel)
Alloy Cast Steel Co., The,
Marion, Ohio.
Babcock & Wilcox Tube Co.,
85 Liberty St., New York City.
Bethlehem Steel Co., Bethlehem, Pa.
Chicago Steel Foundry Co.,
3720 S. Kedzie Ave., Chicago, Ill.
Damascus Steel Casting Co.,
New Brighton, Pa.
Farrell-Cheek Steel Foundry Co.,
Sandusky, O.
Industrial Steel Casting Co.,
Toledo, O.
Sivyer Steel Casting Co.,
Milwaukee, Wis.
Taylor Wharton Iron & Steel Co.,
Easton, Pa.
Treadwell Engineering Co.,
Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
Aluminum Co. of America,
2408 Oliver Bldg., Pittsburgh.
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bronze Die Cast Corp.,
100 Arthur St., Buffalo, N. Y.
Cadman, A. W., Mfg. Co.,
2816 Smallman St., Pittsburgh.
Erie Bronze Co.,
402 W. 19th St., Erie, Pa.
General Bronze Co.,
3216 Smallman St., Pittsburgh.
Pittsburgh Brass Mfg. Co.,
32nd & Penn Ave., Pittsburgh.

CASTINGS (Die) — See DIE CASTINGS

CASTINGS (Electric Steel)
American Rolling Mill Co.,
Middletown, O.
Chicago Steel Foundry Co.,
3720 S. Kedzie Ave., Chicago, Ill.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland.
Farrell-Cheek Steel Foundry Co.,
Sandusky, O.
Industrial Steel Casting Co.,
Toledo, O.
Maynard Electric Steel Castings Co.,
2-12 Kilbourn Rd., Milwaukee.
Pittsburgh Electric Furnace Corp.,
P. O. Box 1125, Pittsburgh, Pa.
Sivyer Steel Casting Co.,
Milwaukee, Wis.
West Steel Castings Co., The,
805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Cascade Foundry Co., 19th and Plum Sts., Erie, Pa.
Forest City-Walworth Run Foundries, W. 27th & Nickel Plate R.R., Cleveland, Ohio.
Lake Shore Engine Works,
Marquette, Mich.
Manning, Maxwell & Moore, Inc.,
100 E. 42nd St., New York City.
Midvale Co., The, Nicetown,
Philadelphia, Pa.
National Roll & Foundry Co.,
The, Avonmore, Pa.
Sutton Engineering Co.,
Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co.,
Easton, Pa.
United Engineering & Foundry Co.,
Farmers Bk. Bldg., Pittsburgh.

CASTINGS (Heat Resisting)
Driver-Harris Co., Harrison, N. J.
National Alloy Steel Co.,
Blawnox, Pa.

CASTINGS (Malleable)
Iowa Malleable Iron Co.,
Fairfield, Iowa.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Meeker Foundry Co., Clay & Ogden Sts., Newark, N. J.
Peoria Malleable Castings Co.,
Peoria, Ill.
Vermilion Malleable Iron Co.,
Hoopeston, Ill.

CASTINGS (Manganese Steel)
Alloy Cast Steel Co., The,
Marion, Ohio.
American Manganese Steel Co.,
Chicago Heights, Ill.
Damascus Steel Casting Co.,
New Brighton, Pa.
Taylor Wharton Iron & Steel Co.,
Easton, Pa.

CASTINGS (Nickel Chromium)
Alloy Cast Steel Co., The,
Marion, Ohio.
Chicago Steel Foundry Co.,
3720 S. Kedzie Ave., Chicago, Ill.
Driver-Harris Co., Harrison, N. J.

CASTINGS (Steel)
Alloy Cast Steel Co., The,
Marion, Ohio.
American Adamite Co., The,
410 Oliver Bldg., Pittsburgh, Pa.
American Rolling Mill Co.,
Middletown, O.
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Atlas Steel Casting Co., 1963 Elmwood Ave., Buffalo, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Chicago Steel Foundry Co.,
3720 S. Kedzie Ave., Chicago, Ill.
Commercial Steel Castings Co.,
The, Marion, O.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland.
Duquesne Steel Foundry Co.,
Union Bank Bldg., Pittsburgh.
Erie Forge Co., Erie, Pa.
Farrell-Cheek Steel Foundry Co.,
Sandusky, O.
Industrial Steel Casting Co.,
Toledo, O.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh.
Maynard Electric Steel Castings Co.,
2-12 Kilbourn Rd., Milwaukee.
Mesta Machine Co.,
P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown,
Philadelphia, Pa.
National Roll & Foundry Co., The,
Avonmore, Pa.
Reliance Steel Casting Co., 28th & Smallman Sts., Pittsburgh, Pa.
Sivyer Steel Casting Co.,
Milwaukee, Wis.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Strong Steel Foundry Co.,
33 Norris St., Buffalo, N. Y.
Taylor Wharton Iron & Steel Co.,
Easton, Pa.
Treadwell Engineering Co.,
Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co.,
Farmers Bank Bldg., Pittsburgh.
West Steel Castings Co., The,
805 E. 70th St., Cleveland, O.

CASTINGS (Worm & Gear Bronze)
Buffalo Bronze Die Cast Corp.,
100 Arthur St., Buffalo, N. Y.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CASTORS (Plate Mills) — See PLATE CASTORS

CEMENT (High Temperature)
Carborundum Co., The,
Perth Amboy, N. J.
General Refractories Co.,
106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co.,
Farmers Bk. Bldg., Pittsburgh.
North American Refractories Co.,
1012 National City Bk., Cleveland.

CEMENT MACHINERY
Allis-Chalmers Mfg. Co.,
Milwaukee, Wis.

CENTRAL STATION EQUIPMENT
Westinghouse Electric & Mfg. Co.,
E. Pittsburgh, Pa.

CHAIN-MAKING MACHINERY
Nilson, A. H., Machine Co.,
Bridgeport, Conn.

CHAINS (For Drives, Conveyors & Elevators)
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHARCOAL
Hillman Coal & Coke Co.,
First Nat. Bk. Bldg., Pittsburgh.

CHARGING MACHINES (Cupola)
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave.
Montour Falls, N. Y.

CHEMICALS
American Cyanamid Co.,
535-5th Ave., New York City.
Ford, The J. B., Co.,
Wyandotte, Mich.

CHROME ORE
General Refractories Co.,
106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co.,
Farmers Bk. Bldg., Pittsburgh.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co.,
Harrison Bldg., Philadelphia, Pa.

CHROMIUM METAL
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.

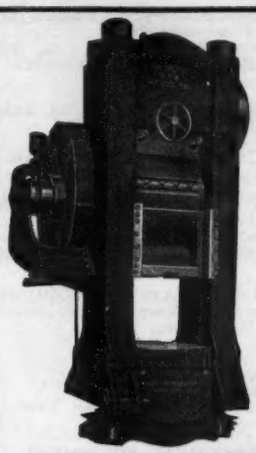
CLAMPS (Drop Forged)
Williams, J. H., & Co.,
400 Vulcan St., Buffalo, N. Y.

CLAY GUNS (Electric)
Bailey, Wm. M., Co.,
Magee Bldg., Pittsburgh, Pa.

CLEANING SPECIALTIES
American Chemical Paint Co.,
Ambler, Pa.
Ford, The J. B., Co.,
Wyandotte, Mich.

CLUTCHES
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above



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FOR STEEL, COPPER AND ALLOYS.

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HAUCK *Micro-Vernier Oil Regulating Valves*

Minute, instant and positive regulation of any type oil burner. For use with any grade of fuel oil at all operating pressures. *Saves fuel. Saves time. Avoids clogging troubles.* Eliminates that "fading away" flame so often experienced with needle and other type valves. WRITE FOR FREE TRIAL OFFER.

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135 Tenth Street Brooklyn, N. Y.

CLUTCHES (Cut-Off Coupling)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTHES (Friction)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

COAL AND COKE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna Furnace Corp., The Detroit, Mich.
Hillman Coal & Coke Co., First Nat. Bk. Bldg., Pittsburgh.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York.
Snyder, W. P., Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg, Birmingham, Ala

COAL CRUSHERS AND PULVERIZERS
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

COAL, ORE and ASH HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

COKE—See COAL AND COKE

COKE OVENS (By-Product)
Koppers Construction Co., The, 1301 Koppers Bldg., Pittsburgh, Pa.

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

COMPENSATORS (Automatic)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland.

COMPOUND (Carburizing)
American Cyanamid Co., 535-5th Ave., New York City.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady.
Ingersoll-Rand Co., 11 Broadway, New York City.
Sullivan Machinery Co., 820 Wrigley Bldg., Chicago.

CONCRETE REINFORCING BARS —See BARS (Concrete Reinforcing)

CONDENSERS (Surface, Barometric, Multi-Jet)
Ingersoll-Rand Co., 11 Broadway, New York City.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, O.

CONSTRUCTION (Industrial Buildings)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTROLLERS (Electric)
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland.

CONVEYORS (Elevating and Conveying)
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

COOLING EQUIPMENT
Coppus Engineering Co., Park Ave., Worcester, Mass.

COTTER PINS
Hindley Mfg. Co., John St., Valley Falls, R. I.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

COUNTING MACHINES
Veeder-Root, Inc., Hartford, Conn.

COUPLINGS (Flexible)
Bartlett-Hayward Co. 200 Scott St., Baltimore, Md.
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
James, D. O., Mfg. Co., 1114 W. Monroe St., Chicago, Ill.

CRANES (Charging)
Alliance Machine Co., The, Alliance, O.
Morgan Engineering Co., Alliance, O.

CRANES (Creeper, Erection)
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CRANES (Electric Traveling)
Alliance Machine Co., The, Alliance, O.
Box Crane & Hoist Corp., Janney & E. Ontario Sts., Philadelphia.
Cleveland Crane & Engrg. Co., The, Wickliffe, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Milwaukee Electric Crane & Hoist Corp., 60th & Greenfield Ave., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.
Northern Engineering Works, 210 Chene St., Detroit, Mich.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Gantry)
Cleveland Crane & Engineering Co., The, Wickliffe, O.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Hand Traveling)
Box Crane & Hoist Corp., Janney and E. Ontario Sts., Philadelphia.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Milwaukee Electric Crane & Hoist Corp., 60th & Greenfield Ave., Milwaukee, Wis.
Northern Engineering Works, 210 Chene St., Detroit, Mich.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.

CRANES (Jib)
Box Crane & Hoist Corp., Janney & E. Ontario Sts., Philadelphia.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Northern Engineering Works, 210 Chene St., Detroit, Mich.

CRANES (Locomotive)
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland.

CRANES (Portable)
Beatty Machine & Mfg. Co., Hammond, Ind.

CRANK SHAFTS
Leard, Wm., Co., The, 16th St. & 5th Ave., New Brighton, Pa.

CRUSHING, GRINDING AND PULVERIZING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Fuller Lehigh Co., Fullerton, Pa.
Morgan Engineering Co., Alliance, O.

CUTTING AND WELDING—see WELDING

CUTTING OILS
Sun Oil Co., 1608 Walnut St., Philadelphia, Pa.

CYLINDERS (Pressure)
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Scaife, Wm. B., & Sons Co., Oakmont, Pa.

DECARBONIZING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Co., 47th and Hatfield, Pittsburgh, Pa.

DIE CASTINGS
Allied Die-Casting Corp., Honeywell St. & Skillman Ave., Long Island City, N. Y.
Newton Die Casting Corp., 146 Munson St., New Haven, Conn.

DIE HEADS (Automatic)
Landis Machine Co., Waynesboro, Pa.

DIE STEEL
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Co., 47th and Hatfield, Pittsburgh.

DIES
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N.Y.
Toledo Mach. & Tool Co., Toledo, O.

DOGS (Drop Forged)
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

DOLOMITE MACHINES (Back Wall)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

DOORS AND SHUTTERS (Steel, Fire and Rolling)
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

DRAW BENCHES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Vaughn Machinery Corp., Cuyahoga Falls, O.

DRILL RODS—See RODS (Drill)

DRILLING MACHINES (Multiple, Heavy Duty)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

DRILLING MACHINES (Radial)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

DRILLS (Electric)
Independent Pneumatic Tool Co., 228 So. Jefferson St., Chicago.

DRILLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Independent Pneumatic Tool Co., 228 S. Jefferson St., Chicago.

DRILLS (Twist)—See TWIST DRILLS

DRIVES (Cut Herringbone Gears)
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
Lewis Foundry & Machine Co., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.

DRYERS (Paint, Varnish, Enamel, Chemical)
Drying Systems, Inc., 1814 Foster Ave., Chicago, Ill.

DRYERS (Sand, Coal, Ores, Chemical, Etc.)
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

DUST COLLECTING EQUIPMENT
Pangborn Corp., P. O. Box 858, Hagerstown, Md.

ECONOMIZERS
Babcock & Wilcox Co., 85 Liberty St., New York City.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago.

ELEVATING AND CONVEYING MACHINERY — See CONVEYORS

ELEVATORS (Bucket)
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Link-Belt Co., 300 W. Pershing Road, Chicago.

ENGINEERS AND CONTRACTORS
Austin Co., The, 16112 Euclid Ave., Cleveland, O.
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
Laughlin, Alex, & Co., First National Bank Bldg., Pittsburgh.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Pennsylvania Engineering Works, New Castle, Pa.
Phoenix Bridge Co., 20 South 15th St., Philadelphia, Pa.
Pittsburgh Bridge & Iron Works, Fulton Bldg., Pittsburgh, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

ENGINEERS (Consulting)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Freyn Engineering Co., 310 S. Michigan Ave., Chicago.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Perin & Marshall, 11 West 42nd St., New York City.
Shover, Barton R., Oliver Bldg., Pittsburgh, Pa.
Worthington, Warren, Oliver Bldg., Pittsburgh, Pa.

ENGINEERS, CONSULTING (By-Product Coke Oven and Gas Plants)
Koppers Construction Co., The, 1301 Koppers Bldg., Pittsburgh.

ENGINES (Gas, Oil)
Fairbanks, Morse & Co., 900 S. Wabash St., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.

FACING BLOCKS
Mummert-Dixon Co., Hanover, Pa.

FACING MACHINES (Structural)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

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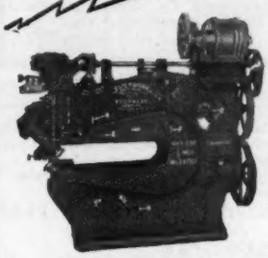

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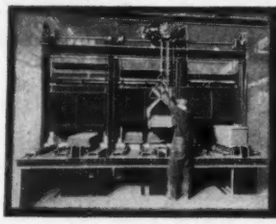

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Driver-Harris Co., Harrison, N. J.
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Vanadium Corp. of America, 120 Broadway, New York City.

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Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

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Vanadium Corp. of America, 120 Broadway, New York City.

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FIRE BRICK—See REFRACTORIES

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Climax Fire Brick Co., Climax, Pa.
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh.
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., Ambassador Bldg., St. Louis, Mo.
North American Refractories Co., 1012 Nat. City Bank, Cleveland.
Stowe Fuller Refractories Co., 2008 Union Trust Bldg., Cleveland.
U. S. Refractories Corp., Mt. Union, Pa.

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Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

FLEXIBLE SHAFT EQUIPMENT
Keller Mechanical Engrg. Corp., 70 Washington St., Brooklyn, N. Y.

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Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

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Alan Wood Steel Co., Conshohocken, Pa.
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.
Hendrick Mfg. Co., 35 Dundaff St., Carbondale, Pa.

FLOOR PLATES—See PLATES

FLUORSPAR
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York.

FLUX (Steel)
Refined Steel Products Co., Clark Bldg., Pittsburgh, Pa.

FLUX (Welding)
Oxweld Acetylene Co. 30 E. 42nd St., New York City.

FORGING BILLETS — See BILLETS

FORGING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.

FORGINGS (Brass, Bronze and Copper)
American Brass Co., 25 Broadway, New York.
Storms Drop Forging Co., Springfield, Mass.

FORGINGS (Drop)
Alliance Drop Forgings Co., Alliance, O.
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Bethlehem Steel Co., Bethlehem, Pa.
Canton Forge & Axle Co., 2001-2037 Dueber Ave., Canton, O.
Drop Forging Co. of N. Y., 324 West Side Ave., Jersey City, N. J.
Fruin Drop Forge Co., 341-355 W. Root St., Chicago, Ill.
Heppenstall Co., 47th & Hatfield Sts., Pittsburgh, Pa.
National Lock Washer Co., 40 Hermon St., Newark, N. J.
Oliver Iron & Steel Corp., S. 10th and Muriel St., Pittsburgh.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Queen City Forging Co., The, 235 Tennyson St., Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Steel Car Forge Co., 410 Frick Bldg., Pittsburgh, Pa.
Storms Drop Forge Co., Springfield, Mass.
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

FORGINGS (Hollow Bored)
American Hollow Boring Co., 19th & Raspberry Sts., Erie, Pa.
Erie Forge Co., Erie, Pa.
National Forge & Ordnance Co., Irvine, Warren Co., Pa.

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Bethlehem Steel Co., Bethlehem, Pa.
Drop Forging Co. of N. Y., 324 West Side Ave., Jersey City, N. J.
Erie Forge Co., Erie, Pa.
Leard, Wm., Co., The, 16th St. & 5th Ave., New Brighton, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Forge & Ordnance Co., Irvine, Warren Co., Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Forge & Iron Co., 801 Chamber of Commerce Bldg., Pittsburgh, Pa.
Rockford Drop Forge Co., Rockford, Ill.
Steel Car Forge Co., 410 Frick Bldg., Pittsburgh, Pa.
Taylor Wharton Iron & Steel Co., Easton, Pa.
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Bethlehem Steel Co., Bethlehem, Pa.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh.

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Nilson, A. H., Machine Co., Bridgeport, Conn.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FURNACE CONTROLS (Open Hearth)
Morgan Construction Co., Worcester, Mass.

FURNACE INSULATION — See INSULATION

FURNACE WALLS
Detrick, M. H., Co., 140 S. Dearborn St., Chicago, Ill.

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Freyn Engineering Co., 310 S. Michigan Ave., Chicago.
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McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

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Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh, Pa.

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Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.

FURNACES (Open-Hearth)
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Laughlin, Alex, & Co., First National Bank Bldg., Pittsburgh.

FURNACES (Recuperative)
Chapman-Stein Co., The, Mt. Vernon, Ohio.
Dixon, H. L., Co., Carnegie, Pa.
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.

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Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.
Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.

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Morgan Construction Co., Worcester, Mass.
Strong, Carlisle & Hammond Co., 1392 West 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh, Pa.

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Chapman-Stein Co., The, Mt. Vernon, Ohio.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Dixon, H. L., Co., Carnegie, Pa.
Electric Furnace Co., The, Wilson St. at P. R. R., Salem, O.
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Hevi Duty Electric Co., 4100 Highland Blvd., Milwaukee.
Rust Engineering Co., The, 2600 Koppers Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh, Pa.
Westinghouse Electric & Mfg. Co., Mansfield, Ohio.

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Aetna-Standard Engineering Co., The, Youngstown, Ohio.
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Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.

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Prest-O-Lite Co., Inc., The, 30 E. 42nd St., New York City.

GAS HOLDERS
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.

GAS METERS—See METERS (Gas and Air)

GASOLINE
Texas Co., The, 17 Battery Place, New York City.

GAS PRODUCER PLANTS
Flinn & Dreffein Co., 308 W. Washington St., Chicago, Ill.
Koppers Construction Co., The, 1301 Koppers Bldg., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

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Koppers Construction Co., The, 1301 Koppers Bldg., Pittsburgh.

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Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.

GEAR GENERATORS
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.

GEARS (Reverse Marine)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

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Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
Grant Gear Works, Second and B Sts., Boston, Mass.
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Johnson, Carlyle, Machine Co., The, Manchester, Conn.
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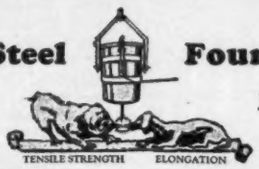

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General Electric Co., Schenectady, N. Y.
Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland, O.

GENERATORS (Acetylene) — See ACETYLENE GENERATORS

GENERATORS (Electric)
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General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Coit Rd. and Kirby Ave., Cleveland, O.
Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland, O.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

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Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GOGGLES (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

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Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.
Hendrick Mfg. Co., 35 Dundaff St., Carbondale, Pa.

GREASES
Texas Co., The, 17 Battery Place, New York City.

GRINDERS (Electric, Pneumatic, Portable)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Independent Pneumatic Tool Co., 228 So. Jefferson St., Chicago.

GRINDERS (Flexible Shaft)
Keller Mechanical Engrg. Corp., 70 Washington St., Brooklyn, N. Y.

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Mummert-Dixon Co., Hanover, Pa.

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Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
Norton Co., Worcester, Mass.

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Farrell-Cheek Steel Foundry Co., Sandusky, O.
Mummert-Dixon Co., Hanover, Pa.
Norton Co., Worcester, Mass.

GRINDING PANS
Phillips & McLaren Co., 24th & Smallman Sts., Pittsburgh, Pa.

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Norton Co., Worcester, Mass.

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Breese Bros. Co., The, 2347 Reading Rd., Cincinnati, O.

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Heppenstall Co., 47th & Hatfield, Pittsburgh, Pa.

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Nazel Engrg. & Machine Wks., 4100 W. 5th St., Philadelphia.

HAMMERS (Board Drop)
Erie Foundry Co., Erie, Pa.

HAMMERS (Chipping, Riveting, Calking)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Independent Pneumatic Tool Co., 228 So. Jefferson St., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.

HAMMERS (Drop)
Bliss, E. W., Co., 53rd and 2nd Ave., Brooklyn, N. Y.
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co., Alliance, Ohio.
Toledo Machine & Tool Co., Toledo, O.

HAMMERS (Power)
Nazel Engrg. & Machine Wks., 4100 W. 5th St., Philadelphia, Pa.
Quickwork Co., The, St. Mary's, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

HAMMERS (Steam)
Alliance Machine Co., The, Alliance, O.
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co., Alliance, Ohio.

HANGERS (Door)
Myers, F. E., & Brother Co., The, Ashland, Ohio.

HANGERS (Shaft)
Hyatt Roller Bearing Co., Harrison, N. J.

HARDNESS TESTING MACHINES
Shore Instrument & Mfg. Co., Van Wyck Ave. and Caril St., Jamaica, N. Y.

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Babcock & Wilcox Co., 85 Liberty St., New York City.

HEATERS (Electric Roll)
Freyn Engineering Co., 310 S. Michigan Ave., Chicago.

HEAT TREATING (Commercial)
Lakeside Steel Improvement Co., 5418 Lakeside Ave., Cleveland.

HOISTING MACHINERY
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

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Box Crane & Hoist Corp., Janney and Ontario Sts., Philadelphia.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Harnishfeger Corp., 3811 National Ave., Milwaukee, Wis.
Milwaukee Electric Crane & Hoist Corp., 60th & Greenfield Ave., Milwaukee, Wis.
Northern Engineering Works, 210 Chene St., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave. Montour Falls, N. Y.

HOISTS (Monorail)
Milwaukee Electric Crane & Hoist Corp., 60th & Greenfield Ave., Milwaukee, Wis.

HOISTS (Pneumatic)
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.
Independent Pneumatic Tool Co., 228 So. Jefferson St., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.
Northern Engineering Works, 210 Chene St., Detroit, Mich.

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Sullivan Machinery Co., 820 Wrigley Bldg., Chicago, Ill.

HOOPS AND BANDS
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.
Ryerson, Joseph T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Sharon Steel Hoop Co., Sharon, Pa.
West Leechburg Steel Co., Farmers Bk. Bldg., Pittsburgh.

HOSE (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

HOT BEDS
Treadwell Engineering Co., Easton, Pa.

HOT BLAST STOVES
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

HYDRANTS (Fire)
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

HYDRAULIC MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Morgan Engineering Co., Alliance, Ohio
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

HYDRAULIC PRESSES—See PRESSES (Hydraulic)

INGOT MOLDS
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Shenango-Penn Mold Co., Oliver Bldg., Pittsburgh, Pa.
Valley Mould & Iron Corp., Hubbard, Ohio.

INGOTS (Aluminum)
Aluminum Co. of America, 2408 Oliver Bldg., Pittsburgh.

INSTRUMENTS Electric, Indicating and Recording)
General Electric Co., Schenectady, N. Y.

INSULATING BLOCK
Armstrong Cork & Insulation Co., Lancaster, Pa.

INSULATING BRICK
Armstrong Cork & Insulation Co., Lancaster, Pa.
General Insulating & Mfg. Co., Alexandria, Ind.

INSULATING POWDER AND CEMENT
Armstrong Cork & Insulation Co., Lancaster, Pa.
General Insulating & Mfg. Co., Alexandria, Ind.

INSULATION (Furnace, Boiler Settings, Ovens, Steam Pipe, Etc.)
Armstrong Cork & Insulation Co., Lancaster, Pa.
General Insulating & Mfg. Co., Alexandria, Ind.

IRON—See STEEL

IRON (Bar)
Bethlehem Steel Co., Bethlehem, Pa.
Burden Iron Co., The, Troy, N. Y.
Penn Iron & Steel Co., Creighton, Pa.
Wrought Iron Co. of America, Lebanon, Pa.

IRON (Chain)
Bethlehem Steel Co., Bethlehem, Pa.

IRON (Engine Bolt)
Bethlehem Steel Co., Bethlehem, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Wrought Iron Co. of America, Lebanon, Pa.

IRON (Pig)—See PIG IRON

IRON (Staybolt)
Bethlehem Steel Co., Bethlehem, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Wrought Iron Co. of America, Lebanon, Pa.

IRON ORE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna Furnace Corp., The, Detroit, Mich.
Hillman Coal & Coke Co., First Nat. Bank Bldg., Pittsburgh, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Quinn, Clement K., & Co., Duluth, Minn.

KEROSENE
Texas Co., The, 17 Battery Place, New York City.

KNIVES AND SHEAR BLADES —See SHEAR BLADES AND KNIVES

LATHE DOGS
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

LATHE SPINDLES
American Hollow Boring Co., 19th & Raspberry Sts., Erie, Pa.

LATHES
Ryerson, Jos., T., & Son, Inc., 16th and Rockwell Sts., Chicago.

LATHES (Roll Turnings)
Lewis Foundry & Machine Co., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

LATHES (Vertical Turret)
Bullard Co., The, Bridgeport, Conn.

LEAD BURNING
Lovsey, Charles H., Co., 704 Park Bldg., Pittsburgh, Pa.

LEAD BURNERS APPARATUS (Oxy-Acetylene)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

LEAD POTS—See POTS (Lead)

LEVELING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, O.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.
Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.

LIFTING MAGNETS—See MAGNETS (Lifting)

LOCK WASHERS
American Nut & Bolt Fastener Co., The, 2029 Doerr St., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Mansfield Lock Washer Co., 9771 French Rd., Detroit, Mich.
National Lock Washer Co., The, 40 Hermon St., Newark, N. J.
Positive Lock Washer Co., The, Ave. A & Miller St., Newark, N. J.
Reliance Mfg. Co., The, Massillon, O.

LOCOMOTIVE CRANES—See CRANES (Locomotives)

LOCOMOTIVES (Electric)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
General Electric Co., Schenectady, N. Y.

LOCOMOTIVES (Storage Battery)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

LUBRICANTS
Texas Co., The, 17 Battery Place, New York City.

LUBRICATORS (Force Feed)
Hills-McCanna Co., 2349 Nelson St., Chicago, Ill.

LUMBER (Creosoted or Zinc Treated)
Century Wood Preserving Co., 1738 Koppers Bldg., Pittsburgh.

MACHINE WORK
Air Tight Steel Tank Co., Hazelwood Branch, P. O. Box 962, Pittsburgh, Pa.
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

MACHINERY (Special)
Aetna-Standard Engineering Co., The, Youngstown, O.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Lewis Foundry & Machine Co., Pittsburgh, Pa.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Nilson, A. H., Machine Co. Bridgeport, Conn.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.

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MAGNETIC SEPARATORS—See SEPARATORS (Magnetic)

MAGNETS (Lifting)
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland.
Ohio Electric Mfg. Co., The, 5906 Maurice Ave., Cleveland, O.

MAGNESITE (Dead Burned)
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bk. Bldg., Pittsburgh.

MANGANESE METALS
American Manganese Steel Co., Chicago Heights, Ill.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

MANGANESE ORE
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

MANIFOLDS (Oxygen)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

MATERIAL HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

METAL (Perforated)—See PERFORATED METAL

METAL CLEANERS
American Chemical Paint Co., Ambler, Pa.
Ford, The J. B, Co, Wyandotte, Mich

METAL SPECIALTIES AND PARTS—See STAMPINGS

METAL STAMPINGS—See STAMPINGS

METAL WORKING MACHINES—See SHEET METAL WORKING MACHINERY

METALS (Nonferrous)
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

METERS (Gas and Air)
Cutler-Hammer, Inc., Milwaukee.

MICROMETERS
Brown & Sharpe Mfg. Co., Providence, R. I.

MILLING MACHINES
Brown & Sharpe Mfg. Co., Providence, R. I.

MILLS (Blooming, Universal, Plate, Sheet, Tin, Bar)—See ROLLING MILL EQUIPMENT

MINING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

MIXING, KNEADING, TEMPERING AND PUGGING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

MOLDING MACHINES
Herman Pneumatic Machine Co., 806 Union Bk. Bldg., Pittsburgh, Pa.

MOLDING MACHINES (Tractor Type Sand Throwing)
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

MOLDS (Ingot)—See INGOT MOLDS

MONEL METAL
International Nickel Co., 67 Wall St., New York City.

MONORAIL SYSTEMS
Box Crane & Hoist Corp., Janney & E. Ontario St., Philadelphia.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.

MOTORS (Electric)
Century Electric Co., 1806 Pine Ave., St. Louis, Mo.
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago.
General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Coit Rd. and Kirby Ave., Cleveland, O.
Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland, O.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

MUCK BAR
Bethlehem Steel Co., Bethlehem, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

NAILS
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., The, Youngstown, O.

NAILS (Coated and Galvanized)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Youngstown Sheet & Tube Co., The, Youngstown, O.

NICKEL
International Nickel Co., 67 Wall St., New York City.

NICKEL STEEL (Cold Drawn)
Bethlehem Steel Co., Bethlehem, Pa.

NITROGEN (Gas)
Linde Air Products Co., 30 E. 42nd St., New York City.

NUTS
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland Cap Screw Co., The, 2921 E. 79th St., Cleveland, O.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh.
Oliver Iron & Steel Corp., S. 10th and Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Wrought Iron Co. of America, Lebanon, Pa.

OIL AND GREASES
Texas Co., The, 17 Battery Place, New York City.

OPEN-HEARTH FURNACES—See FURNACES (Open Hearth)

OVENS (Coke, By-Product Recovery)
Koppers Construction Co., The, 1301 Koppers Bldg., Pittsburgh.

OVENS (Japanning, Enameling, Lacquering, Core Baking)
Drying Systems, Inc., 1814 Foster Ave., Chicago, Ill.

OVENS—SPECIAL (Gas or Oil Heat)
Drying Systems, Inc. 1814 Foster Ave., Chicago, Ill.

OXY-ACETYLENE WELDING AND CUTTING—See WELDING

OXYGEN IN CYLINDERS
Air Reduction Sales Co., 60 E. 42nd St., New York City.
Linde Air Products Co., 30 E. 42nd St., New ork City.

PERFORATED METAL
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Harrington & King Perforating Co., The, 5634 Fillmore St., Chicago.
Hendrick Mfg. Co., 35 Dundaff St., Carbondale, Pa.
Mundt, Chas., & Sons, Johnston and Fairmount Ave., Jersey City, N. J.

PICKLING EQUIPMENT
Weaver Bros. Co., Adrian, Mich.

PICKLING COMPOUND
American Chemical Paint Co., Ambler, Pa.
Hearne, William M., Inc., Real Estate Trust Bldg., Philadelphia.

PICKLING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.

PICKLING TANKS
Hauser-Stander Tank Co., Cincinnati, Ohio.

PIG IRON
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Chateaugay Ore & Iron Co., 26 Liberty St., New York City.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Globe Iron Co., Jackson, O.
Hanna Furnace Corp., The, Detroit, Mich.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Pilling & Co., Inc., 1500 Chestnut St., Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.
Valley Mould & Iron Corp., Hubbard, Ohio.

PIG IRON (Charcoal)
Superior Charcoal Iron Co., Grand Rapids, Mich.

PILING (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.

PINIONS—See GEARS AND GEAR CUTTING

PIPE (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

PIPE (Brass, Bronze, Copper)
American Brass Co., 25 Broadway, New York City.
Chase Brass & Copper Co., Waterbury, Conn.

PIPE (Seamless Steel and Seamless Iron)
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.

PIPE (Steel)
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh.
Michigan Steel Tube Products Co., Holbrook & Buffalo Sts., Detroit, Mich.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Petroleum Iron Works Co., The, Sharon, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh.
Republic Iron & Steel Co., Youngstown, O.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., The, Youngstown, O.

PIPE (Wrought Iron)
Reading Iron Co., Reading, Pa.

PIPE (Wrought Steel)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PIPE BALLS (Steel, Welding)
Damascus Steel Casting Co., New Brighton, Pa.

PIPE CUTTING & THREADING MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Landis Machine Co., Waynesboro, Pa.

PIPE FITTINGS
Pittsburgh Piping & Equipment Co., 43rd St. and A. V. R. R., Pittsburgh, Pa.

PIPE LINES (Riveted & Welded)
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.

PIPE MILL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE STRAIGHTENING MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPING CONTRACTORS
Pittsburgh Piping & Equipment Co., 43rd St., and A. V. R. R., Pittsburgh, Pa.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PISTON RODS
Heppenstall Co., 47th and Hatfield, Pittsburgh.

PLANERS AND SHAPERS
Cincinnati Shaper Co., Cincinnati.
Ryerson, Jos. T., & Son, Inc. 16th and Rockwell Sts., Chicago.

PLATE CASTORS
Hyatt Roller Bearing Co., Harrison, N. J.

PLATES (Iron and Steel)
American Rolling Mill Co., Middletown, O.
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.

PLATES (Manganese Steel)
Taylor Wharton Iron & Steel Co., Easton, Pa.

PLATES (Rolled Steel—Floor)
Alan Wood Steel Co., Conshohocken, Pa.
American Pressed Steel Co., Commercial Trust Bldg., Philadelphia, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

PLATES (Sheared and Universal)
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Granite City Steel Co., The, Granite City, Ill.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Joseph T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Youngstown Sheet & Tube Co., The, Youngstown, O.

PLATES (Terne and Tin)—See TIN PLATE

PNEUMATIC TOOLS—See TOOLS (Pneumatic)

POLE LINE HARDWARE
Oliver Iron & Steel Corp., S. 10th and Muriel, Pittsburgh.

POLES (Tubular Steel)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PORCELAIN ENAMELING EQUIPMENT
Ferro Enamel Supply Co., Keith Bldg., Cleveland, O.

PORCELAIN ENAMELS
Ferro Enamel Supply Co., Keith Bldg., Cleveland, O.

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Farrell-Cheek Steel Foundry Co., Sandusky, O.

POWDERED COAL EQUIPMENT
Fuller-Lehigh Co., Fullerton, Pa.

PREHEATERS
Babcock & Wilcox Co., 85 Liberty St., New York City.
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

PREHEATING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

PRESSED METAL—See STAMPINGS

PRESSES
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Erie Foundry Co., Erie, Pa.
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Toledo Mach. & Tool Co., Toledo, O.

PRESSES (Die Cutting)
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Forging)
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Morgan Engineering Co., Alliance, O.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh.

PRESSES (Forming & Braking)
Cincinnati Shaper Co., Cincinnati.

PRESSES (Hydraulic)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Morgan Engineering Co., Alliance, O.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia.

PRESSES (Metal Drawing, Etc.)
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.

PRESSES (Scrap Bundling and Baling)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Straightening)
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh.

PRODUCER GAS SYSTEMS—See GAS PRODUCER PLANTS

PULVERIZING, CRUSHING & GRINDING MACHINERY — See CRUSHING, GRINDING & PULVERIZING MACHINERY

PUMPS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago.

PUMPS (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

PUMPS (Air Lift)
Sullivan Machinery Co., 820 Wrigley Bldg., Chicago, Ill.

PUMPS (Centrifugal)
Ingersoll-Rand Co., (Cameron), 11 Broadway, New York City.

PUMPS (Chemical Proportioning)
Hills-McCanna Co., 2349 Nelson St., Chicago, Ill.

PUMPS (Hand and Power)
Myers, F. E., & Brother Co., The, Ashland, O.

PUMPS (Hydraulic)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

PUMPS (Vacuum & Dry)
Sullivan Machinery Co., 820 Wrigley Bldg., Chicago, Ill.

PUNCHES (Multiple)
Cincinnati Shaper Co., Cincinnati.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland O.

PUNCHING AND SHEARING MACHINERY
Beatty Machine &Mfg. Co., Hammond, Ind.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Long & Allstatter Co., Hamilton, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

PURIFIERS (Steam)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

RAILS
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

REAMERS
Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland, O.

REFRACTORIES
Babcock & Wilcox Co., 95 Liberty St., New York City.
Carborundum Co., The, Perth Amboy, N. J.
Climax Fire Brick Co., Climax, Pa
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bk. Bldg., Pittsburgh.
Illinois Clay Products Co., 214 Barber Bldg., Joliet, Ill.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., Ambassador Bldg., St. Louis, Mo.
Lavino, E. J., Co., Bullitt Bldg., Philadelphia, Pa.
North American Refractories Co., 1012 National City Bk., Cleveland.
Norton Co., Worcester, Mass.
Stowe-Fuller Refractories Co., The, 2008 Union Trust Bldg., Cleveland, O.
U. S. Refractories Corp., Mt. Union, Pa.

REGISTERS (Heating and Ventilating)
Auer Register Co., The, 3608 Payne Ave., Cleveland, O.

REGULATORS (Compressed Gas)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

REGULATORS (Pressure)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

RESISTORS (Edgewound)
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.

RHEOSTATS
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

RINGS (Steel)
Heppenstall Co., 47th & Hatfield, Pittsburgh, Pa.

RINGS (Weldless)
Milwaukee Forge & Machine Co., Milwaukee, Wis.

RIVETERS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.

RIVETING MACHINERY
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.
Shuster, The, F. B., Co., New Haven, Conn.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

RIVET SETS
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.

RIVET SETS AND CHISEL BLANKS
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

RIVETS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th and Muriel Sts., Pittsburgh, Pa.
Progressive Mfg. Co., Torrington, Conn.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Joseph T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Wrought Iron Co. of America, Lebanon, Pa.

ROCK WOOL
General Insulating & Mfg. Co., Alexandria, Ind.

RODS (Brass, Bronze, Copper, Nickel Silver)
American Brass Co., 25 Broadway, New York City.

RODS (Drill)
Globe Wire Co., Sharpsburg, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Vanadium-Alloys Steel Co., Latrobe, Pa.

RODS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

RODS (Rounds, Flats & Shapes)
Washburn Wire Co., Phillipsdale, R. I.

RODS (Welding)—See WELDING RODS

RODS (Wire)—See WIRE PRODUCTS

ROLLING DOORS AND SHUTTERS
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

ROLLING MILL BEARINGS
Hyatt Roller Bearing Co., Harrison, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

ROLLING MILL EQUIPMENT
Alliance Machine Co., The, Alliance, O.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Lewis Foundry & Machine Co., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.
Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.

ROLLING MILLS (Consulting, Contracting Engineers)
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Morgan Construction Co., Worcester, Pa.
Treadwell Engineering Co., Easton, Pa.

ROLLS (Sand and Chilled)
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Duquesne Steel Foundry Co., Union Bk. Bldg., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.

ROLLS (Steel)
American Adamite Co., The, 410 Oliver Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Duquesne Steel Foundry Co., Union Bank Bldg., Pittsburgh, Pa.
Heppenstall Co., 47th & Hatfield, Pittsburgh, Pa.
Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Pittsburgh Rolls Corp., 41st St. and A. V. R. R., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

ROOFING AND SIDING (Corrugated and Plain)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Empire Steel Corp., Mansfield, O.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, Ohio.

ROOFS (Open Hearth & Heating Furnaces)
Detrick, M. H., Co., 140 S. Dearborn St., Chicago.

SAFE ENDS (Boiler Tube)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

SAFETY DEVICES (Electric)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

SAND (Molding)
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York.

SAND—SILICA (Furnace Bottom & Hot Top)
Industrial Silica Corp., 602 Stambaugh Bldg., Youngstown, Ohio.

SAND—SILICA (Steel Molding, Core, Sandblast)
Industrial Silica Corp., 602 Stambaugh Bldg., Youngstown, O.

SANDBLAST ABRASIVE (Shot and Grit)
Pittsburgh Crushed Steel Co., 61st & A. V. R. R., Pittsburgh, Pa.

SANDBLAST EQUIPMENT AND ACCESSORIES
Pangborn Corp., P. O. Box 858, Hagerstown, Md.

SAND CONDITIONING AND PREPARING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 No. Keeler Ave., Chicago, Ill.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

SAND CONVEYING AND HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Link-Belt Co., 300 W. Pershing Road, Chicago, Ill.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

SAND SLINGERS
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

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Up to 320 tons capacity

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Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

248 of 100 Tons Capacity and over

LADLE AND STANDARD CRANES

58		100 tons
2	WORM DRIVEN Ladle,	100 tons
2		115 tons
5	WORM DRIVEN Ladle,	125 tons
44		125 tons
27		150 tons
2	WORM DRIVEN Ladle,	150 tons
3	WORM DRIVEN Ladle,	160 tons
2	WORM DRIVEN Ladle,	165 tons
3	WORM DRIVEN Ladle,	175 tons
27		175 tons
3	WORM DRIVEN Ladle,	200 tons
2		200 tons
1		225 tons
1		250 tons
3	WORM DRIVEN Ladle,	250 tons
1		275 tons
8		430 tons

STRIPPING CRANES

8		100 tons
1		125 tons
21		150 tons
17		200 tons
1	Single Ram,	320 tons

COMBINATION CHARGERS AND STRIPPERS

3		100 tons
1		125 tons
8		150 tons
4		200 tons

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The Cleveland Crane & Engineering Co.
Wickliffe, Ohio 3*

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HOISTS

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ROEPER Type "R" Hoists are built in capacities from 500 lbs. to 4000 lbs. with or without trolleys — Cord or Push Button Control.

Send for Circular

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Farmers Bank Building, Pittsburgh, Pa.

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Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

SAWS (Cold & Hot Metal)
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh.

SAWS (High Speed Cut-Off Machines)
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

SAWS (Hot & Cold, Tube & Rail)
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

SAWS (Inserted Tooth)
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

SAWS (Metal Cutting Power)
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh.

SCALES (Dial)
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

SCALES (Industrial, Motor, Truck, Railroad Track, Rolling Mill)
Fairbanks, Morse & Co., 900 So. Wabash Ave., Chicago, Ill.

SCALES—AUTOMATIC DIAL (Heavy Duty, Bench, Overhead, Track, Tank, Hanging, Packing, Counting, Special Purposes)
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

SCLEROSCOPE HARDNESS MEASURING
Shore Instrument & Mfg. Co., Van Wyck Ave. and Carll St., Jamaica, N. Y.

SCRAP BALING PRESSES
Logemann Bros., Co., 3126 Burleigh St., Milwaukee, Wis.

SCREENS AND SIEVES
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Harrington & King Perforating Co., 5634 Fillmore St., Chicago.
Hendrick Mfg. Co., 35 Dundaff St., Carbondale, Pa.
Mundt, Chas., & Sons, Johnston and Fairmount Aves., Jersey City, N. J.

SCREW MACHINES (Automatic, Single and Multiple Spindle)
Brown & Sharpe Mfg. Co., Providence, R. I.

SCREW MACHINE PRODUCTS
Barnes, Wallace, Co., The, Bristol, Conn.
Chandler Products Corp., 1491 Chardon Rd., Cleveland, O.
Progressive Mfg. Co., Torrington, Conn.

SCREW MAKING MACHINERY—AUTOMATIC (Shaving, Threading, Pointing)
Economy Engineering Co., The, Willoughby, O.

SCREW STOCK—See STEEL (Screw Stock)

SCREWS
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Progressive Mfg. Co., Torrington, Conn.

SCREWS (Cap, Set, Safety)
Allen Mfg. Co., Hartford, Conn.
Chandler Products Corp., 1491 Chardon Rd., Cleveland, O.
Cleveland Cap Screw Co., The, 2921 E. 79th St., Cleveland, O.
Rhode Island Tool Co., Providence, R. I.

SCREWS (Cold Headed)
Cleveland Cap Screw Co., The, 2921 E. 79th St., Cleveland, O.

SCREWS (Machine)
Chandler Products Corp., 1491 Chardon Rd., Cleveland, O.
Progressive Mfg. Co., Torrington, Conn.

SEAMLESS STEEL TUBING—See TUBES

SEPARATORS (Magnetic)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
Ohio Electric Mfg. Co., The, 5906 Maurice Ave., Cleveland, O.

SHAFT AND PIPE STRAIGHTENERS (Hydraulic)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

SHAFT HANGERS
Hyatt Roller Bearing Co., Harrison, N. J.

SHAFTS (Clutch)
American Hollow Boring Co., 19th & Raspberry Sts., Erie, Pa.

SHAFTING
Bethlehem Steel Co., Bethlehem, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Union Drawn Steel Co., Beaver Falls, Pa.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAPERS—See PLANERS AND SHAPERS

SHAPES (Steel)—See STEEL (Structural)

SHEAR BLADES AND KNIVES
Heppenstall Co., 47th & Hatfield, Pittsburgh, Pa.

SHEARS
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts. Chicago, Ill.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.
Toledo Mach. & Tool Co., Toledo, O.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh, Pa.
Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.

SHEARS (Irregular Cutting)
Quickwork Co., The, St. Mary's, O.

SHEARS (Joggling)
Quickwork Co., The, St. Mary's, O.

SHEARS (Plate Splitting & Shearing)
Quickwork Co., The, St. Mary's, O.

SHEARS, ROTARY (Slitting, Beveling, Circling, Flanging)
SHEARS, ROTARY (Tank & Boiler

SHEARS, ROTARY (Tank & Boiler Head Cutting & Flanging)
Quickwork Co., The, St. Mary's, O.

SHEET BARS
Bethlehem Steel Co., Bethlehem, Pa.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEET METAL PRODUCTS—See STAMPINGS

SHEET METALWORKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Quickwork Co., The, St. Mary's, O.
Toledo Mach. & Tool Co., Toledo, O.

SHEETS (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

SHEETS (Black)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canonsburg Steel & Iron Works, Canonsburg, Pa.
Eastern Rolling Mill Co., Baltimore, Md.
Empire Steel Corp., Mansfield, O.
Granite City Steel Co., The, Granite City, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Newton Steel Co., Youngstown, O.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Seneca Iron & Steel Co., P. O. Box 485, Buffalo, N. Y.
Sharon Steel Hoop Co., Sharon, Pa.
Sheet Steel Trade Extension Com., The, Terminal Tower, Cleveland.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Blue Annealed)
Alan Wood Steel Co., Conshohocken, Pa.
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Empire Steel Corp., Mansfield, O.
Granite City Steel Co., The, Granite City, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Newton Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Sharon Steel Hoop Co., Sharon, Pa.
Sheet Steel Trade Extension Com., The, Terminal Tower, Cleveland.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.

SHEETS (Brass, Bronze, Copper, Nickel Silver)
American Brass Co., 25 Broadway, New York City.

SHEETS (Corrugated)
Apollo Steel Co., Apollo, Pa

SHEETS (Deep Drawing and Stamping)
American Rolling Mill Co., Middletown, Ohio.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Central Alloy Steel Corp., Massillon, O.
Eastern Rolling Mill Co., Baltimore, Md.
Empire Steel Corp., Mansfield, O.
Granite City Steel Co., The, Granite City, Ill.
Newton Steel Co., Youngstown, O.
Republic Steel Corp., Youngstown, O.
Seneca Iron & Steel Co., P. O. Box 485, Buffalo, N. Y.
Sharon Steel Hoop Co., Sharon, Pa.
Youngstown Sheet & Tube Co., Youngstown, Ohio.

SHEETS (Electrical)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Empire Steel Corp., Mansfield, O.
Sheet Steel Trade Extension Com., The, Terminal Tower, Cleveland.

SHEETS (Galvanized)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canonsburg Steel & Iron Works, Canonsburg, Pa.
Granite City Steel Co., The, Granite City, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son., Inc., 16th and Rockwell Sts., Chicago, Ill.
Sheet Steel Trade Extension Com., The, Terminal Tower, Cleveland.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.,
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Lead Coated)
Sheet Steel Trade Extension Com., The, Terminal Tower, Cleveland.

SHEETS (Manganese Steel)
Taylor Wharton Iron & Steel Co., Easton, Pa.

SHEETS (Perforated)
Erdle Perforating Co., 171 York St., Rochester, N. Y.

SHEETS (Roofing)—See ROOFING AND SIDING

SHEETS (Tin)—See TIN PLATE

SHEETS (Tin Mill Black)
Empire Steel Corp., Mansfield, O.
Granite City Steel Co., Granite City, Ill.
Sheet Steel Trade Extension Com., The, Terminal Tower, Cleveland.
Weirton Steel Co., Weirton, W. Va.

SHEETS—HIGH FINISH (Automobile, Metal Furniture, Enameling)
Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co., Middletown, Ohio.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Central Alloy Steel Corp., Massillon, Ohio.
Eastern Rolling Mill Co., Baltimore, Md.
Empire Steel Corp., Mansfield, Ohio.
Newton Steel Co., Youngstown, O.
Seneca Iron & Steel Co., P. O. Box 485, Buffalo, N. Y.
Youngstown Sheet & Tube Co., Youngstown, Ohio.

SHIM STEEL
Cold Metal Process Co., The, 1200 City Bank Bldg., Youngstown, Ohio.

SHIPBUILDING SHAPES
Bethlehem Steel Co., Bethlehem, Pa.

SIEVES—See SCREENS & SIEVES

SILICO-MANGANESE
Vanadium Corp. of America, 120 Broadway, New York City.

SINTERING PLANTS
Greenawalt, John E., 110 E. 42nd St., New York City.

SKIP HOISTS
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

SLOTTING MACHINES
Nazel Engrg. & Machine Wks., 4100 W. 5th St., Philadelphia, Pa.

SMALL TOOLS
Brown & Sharpe Mfg. Co., Providence, R. I.
Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland, O.

SOAKING PIT COVERS
Detrick, M. H., Co., 140 S. Dearborn St., Chicago, Ill.

SOAKING PITS
Chapman-Stein Co., The, † Mt. Vernon, Ohio.
Criswell, James, Co., Keenan Bldg., Pittsburgh, Pa.

SPACING TABLES
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

SPEED REDUCERS
Grant Gear Works, Second and B Sts., So. Boston, Mass.
James, D. O., Mfg. Co., 1114 W. Monroe St., Chicago, Ill.

SPIEGELEISEN
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York.

SPIKES
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.

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Of any kind, in any gauge, made and shipped promptly. We also manufacture perforated Steel for Machinery Guards and carry a stock of perforated Steel. Write for our booklet.

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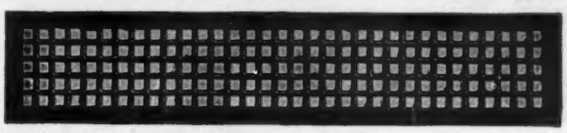
BLAW-KNOX



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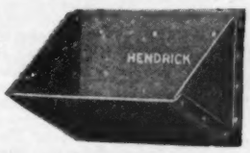
Elevator Buckets of *all* Types



Also perforated metal screens, gear guards, flights and troughs, stacks, tanks and similar equipment.

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New York Office: 30 Church St.
Pittsburgh Office: Koppers Bldg.
Hazleton, Pa., Office: 533 Lincoln Street
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Equipped with hook, bucket, clamshell or magnet, they can easily handle any kind of loose materials. Easily maneuvered on their Corduroy traction—no tracks required.

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Established 1884
3811 National Avenue, Milwaukee, Wis.

SPRINGS
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American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Barnes, Wallace, Co., The, Bristol, Conn.
Barnes-Gibson-Raymond, Inc., 6400 Miller Ave., Detroit, Mich.
Cook Spring Division, The, Barnes-Gibson-Raymond, Inc., Ann Arbor, Mich.
Cuyahoga Spring Co., 10252 Berea Rd., Cleveland, O.
Duer Spring & Mfg. Co., Pittsburgh, Pa.
Dunbar Bros. Co., Bristol, Conn.
Gibson, Wm. D., Co., 1800 Clybourn Ave., Chicago, Ill.
Muehlhausen Spring Co., Loganspport, Ind.
Raymond Mfg. Co., Centre St., Corry, Pa.
Washburn Wire Co., Inc., 118th & Harlem River, New York City.

SPRUE CUTTERS
Shuster, The F. B., Co., New Haven, Conn.

STACKS (Steel)—See BRIDGES, ETC.

STAMPINGS
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Tube & Stamping Plant, The, (The Stanley Works), Bridgeport, Conn.
Barnes-Gibson-Raymond, Inc., 6400 Miller Ave., Detroit, Mich.
Barnes, Wallace, Co., The, Bristol, Conn.
Bay State Stamping Co., 880 Chandler St., Worcester, Mass.
Breese Bros., Co., The, 2347 Reading Rd., Cincinnati, O.
Central Iron & Steel Co., Harrisburg, Pa.
Cook Spring Division, The, Barnes-Gibson-Raymond, Inc., Ann Arbor, Mich.
Crosby Co., The, 183 Pratt St., Buffalo, N. Y.
Cuyahoga Spring Co., 10252 Berea Rd., Cleveland, O.
Dunbar Bros. Co., Bristol, Conn.
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Joliet Wrought Washer Co., Joliet, Ill.
Lansing Stamping Co., Lansing, Mich.
Mundt, Chas., & Sons, Johnston & Fairmount Aves, Jersey City, N. J.
Stanley Works, The, New Britain, Conn.

STAPLES (Wire)
Titchener, E. H., & Co., Binghamton, N. Y.

STARTERS (Electric Motor)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

STEAMSHIP COMPANIES (Lake Passenger & Freight)
Cleveland & Buffalo Transit Co., The, E. 9th St. Pier, Cleveland.

STEEL
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., 3122 Grant Bldg., Pittsburgh, Pa.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Alloy)
Alan Wood Steel Co., Conshohocken, Pa.
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Colonial Steel Co., Grant Bldg., Pittsburgh, Pa.
Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Heppenstall Co., 47th & Hatfield, Pittsburgh, Pa.
Ludlum Steel Co., Watervliet, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., The Canton, O.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.

STEEL (Alloy, Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.

STEEL (Cold Drawn)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Globe Wire Co., Sharpsburg, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Superior Steel Products Co., Monaca, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Corrosion Resisting)
Bethlehem Steel Co., Bethlehem, Pa.
Firth Sterling Steel Co., McKeesport, Pa.
Ludlum Steel Co., Watervliet, N. Y.

STEEL (Crucible)
Colonial Steel Co., Grant Bldg., Pittsburgh, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Electric)
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Co., 47th & Hatfield, Pittsburgh, Pa.
Ludlum Steel Co., Watervliet, N. Y.
National Forge & Ordnance Co., Irvine, Warren Co., Pa.

STEEL (High Speed)
Bethlehem Steel Co., Bethlehem, Pa.
Colonial Steel Co., Grant Bldg., Pittsburgh, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Ludlum Steel Co., Watervliet, N. Y.
Vanadium-Alloys Steel Co., Latrobe, Pa.

STEEL (Manganese)
Taylor Wharton Iron & Steel Co., Easton, Pa.

STEEL (Nitrided)
Central Alloy Steel Corp., Massillon, Ohio.
Ludlum Steel Co., Watervliet, N. Y.

STEEL (Open Hearth)
Timken Roller Bearing Co., The, Canton, O.
Washburn Wire Co., Philipsdale, R. I.

STEEL (Open-Hearth—Cold Drawn)
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.
Ward's, Edgar T., Sons Co. (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.

STEEL (Rustless)—See STEEL (Corrosion Resisting)

STEEL (Screw Stock)
American Steel & Wire Co., 208 S. LaSalle St., Chicago. Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Superior Steel Products Co., Monaca, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Spring)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.

STEEL (Stainless—See STEEL (Corrosion Resisting)

STEEL (Strip, Hot and Cold Rolled)
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
American Tube & Stamping Plant, The, (The Stanley Works) Bridgeport, Conn.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Oliver Iron & Steel Corp., Morris & Bailey Div., Oliver Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th & Rockwell Sts., Chicago.
Stanley Works, The, New Britain, Conn.
Superior Steel Corp., 3122 Grant Bldg., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.,
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh.

STEEL (Structural)
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd & Washington Ave., Philadelphia.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Clinton Bridge Works, Clinton, Ia.
Eichleay, John, Jr., Co., So. 20th and Wharton, Pittsburgh, Pa.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Pittsburgh Bridge & Iron Works, Fulton Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th & Rockwell St., Chicago.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

STEEL (Tool)
Bethlehem Steel Co., Bethlehem, Pa.
Colonial Steel Co., Grant Bldg., Pittsburgh, Pa.
Darwin & Milner, Inc., 1260 W. 4th St., Cleveland, O.
Firth-Sterling Steel Co., McKeesport, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Ludlum Steel Co., Watervliet, N. Y.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th & Rockwell St., Chicago.
Vanadium-Alloys Steel Co., Latrobe, Pa.

STEEL BUILDINGS—See BRIDGES, ETC.

STEEL DOORS AND SHUTTERS —See DOORS & SHUTTERS

STEEL FABRICATORS—See BRIDGES, ETC.

STEEL PLATE CONSTRUCTION
Hendrick Mfg. Co., 35 Dundaff St., Carbondale, Pa.,
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Pennsylvania Engineering Works New Castle, Pa.
Petroleum Iron Works Co., The, Sharon, Pa.
Pollock, William B., Co., The, Youngstown, Ohio.

STEEL PLATES—See PLATES

STELLITE
Haynes Stellite Co., 30 E. 42nd St., New York City.

STEPS (Safety)
Hendrick Mfg. Co., 35 Dundaff St., Carbondale, Pa.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

STRAIGHTENING MACHINERY
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.
Shuster, The F. B., Co., New Haven, Conn.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

STRIP MILLS (Hot or Cold)
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

STRIP STEEL (Precision)
Cold Metal Process Co., The, 1200 City Bank Bldg., Youngstown, O.

SULPHURIC ACID
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland.

SWITCH STANDS
Bethlehem Steel Co., Bethlehem, Pa.

SWITCHES (Electric)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

TANKS (Storage, Pressure, Riveted, Welded)
Air Tight Steel Tank Co., Hazelwood Branch, P. O. Box 962, Pittsburgh, Pa.
Alliance Tank Co., The, Alliance, O.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Petroleum Iron Works Co., The, Sharon, Pa.
Scaife, Wm. B., & Sons Co., Oakmont, Pa.

TANKS—WOOD OR STEEL (Rubber or Lead Lined)
Hauser-Stander Tank Co., Cincinnati, O.

TAPS AND DIES
Landis Machine Co., Waynesboro, Pa.

TERNE PLATE—See TIN PLATE

THERMOMETER SOCKETS
Hills-McCanna Co., 2349 Nelson St., Chicago, Ill.

THREAD CUTTING TOOLS
Landis Machine Co., Waynesboro, Pa.

TIE PLATES
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

TIES (Creosoted)
Century Wood Preserving Co., 1738 Koppers Bldg., Pittsburgh.

TIES (Metal)
Bethlehem Steel Co., Bethlehem, Pa.

TIN PLATE
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Granite City Steel Co., The, Granite City, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., The, Youngstown, O.

TIN PLATE MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, O.
Wean Engineering Co., Inc., The, 2nd Nat. Bank Bldg., Warren, O.

TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

TONGS (Chain Pipe)
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

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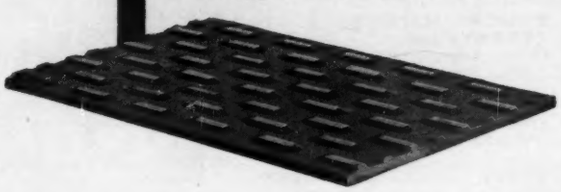

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Firth-Sterling Steel Co., McKeesport, Pa.
Haynes-Stellite Co., 30 E. 42nd St., New York City.

TOOL HOLDERS
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

TOOLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

TORCHES AND BURNERS (Acetylene, Blow, Oxy-Acetylene)
Air Reduction Sales Co., 60 E. 42nd St., New York City.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

TOWERS (Transmission)
American Bridge Co., 71 Broadway, New York City.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.

TRAMRAILS
Cleveland Electric Tramrail, Division of the Cleveland Crane and Engineering Co., Wickliffe, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.

TREADS—See GRATING

TROLLEYS
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.
Roeper Crane & Hoist Works, 1729 N. 10th St., Reading, Pa.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

TRUCKS (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

TRUCKS AND TRACTORS (Electric Industrial)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

TRUCKS & TRACTORS (Gasoline Industrial)
Clark Tructractor Co., Battle Creek, Mich.

TUBE MILL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, O.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

TUBES
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.
Michigan Steel Tube Products Co., Holbrook and Buffalo Sts., Detroit, Mich.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., The, Canton, O.
Tyler Tube & Pipe Co., The, Washington, Pa.
Wanderman, H. L., Co., The, 1440 Broadway, New York City.

TUBES (Alloy)
Allegheny Steel Co., Brackenridge, Pa.
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.

TUBES (Boiler)
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.
Bethlehem Steel Co., Bethlehem, Pa.
Giberson, E. D., & Co., Inc., 40 Rector St., New York City.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tyler Tube & Pipe Co., The, Washington, Pa.
Wanderman, H. L., Co., The, 1440 Broadway, New York City.

TUBES (Brass and Copper)
Wolverine Tube Co., 1441 Central Ave., Detroit, Mich.

TUBES (Charcoal Iron Boiler)
Bethlehem Steel Co., Bethlehem, Pa.

TUBES (Cold Drawn Seamless Steel)
Giberson, E. D., & Co., Inc., 40 Rector St., New York City.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh.
Summerill Tubing Co., Bridgeport, Pa.
Timken Roller Bearing Co., The, Canton, O.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.

TUBES (Lap Welded Boiler)
Bethlehem Steel Co., Bethlehem, Pa.
Babcock & Wilcox Tube Co., 85 Liberty St., New York City.

TUBES (Welded Steel)
Michigan Steel Tube Products Co., Buffalo St., Detroit, Mich.

TUNGSTEN CARBIDE
Haynes Stellite Co., 30 E. 42nd St., New York City.
Ludlum Steel Co., Watervliet, N. Y.

TURBINES (Steam)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

TURBO BLOWERS — See BLOWERS

TURNTABLES
American Bridge Co., 71 Broadway, New York City.

TWIST DRILLS
Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland, O.

VALVES (Back Pressure)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

VALVES (Gas and Air Reversing)
Bailey, Wm. M., Co., Magee Bldg., Pittsburgh, Pa.
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.

VALVES (Hydraulic)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa
Wood, R. D. & Co., 400 Chestnut St., Philadelphia, Pa.

VALVES (Oil Regulating)
Hauck Mfg. Co., 135-10th St., Brooklyn, N. Y.

VALVES (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.

VALVES AND FITTINGS—See PIPE FITTINGS

VANADIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Vanadium Corp. of America, 120 Broadway, New York City.

VIADUCTS (Steel)—See BRIDGES, ETC.

WALKAWAYS - See FLOORING-STEEL

WAREHOUSES (Iron and Steel)
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Ryerson, Jos. T. & Son, Inc., 16th & Rockwell Sts., Chicago.
Union Drawn Steel Co., Beaver Falls, Pa.
Ward's, Edgar T., Sons Co., (Div. Columbia Steel & Shafting Co.), Pittsburgh, Pa.

WASHERS (Iron and Steel)
American Nut & Bolt Fastener Co., The, 2029 Doerr St., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Joliet Wrought Washer Co., Joliet, Ill.
Mansfield Lock Washer Co., 9771 French Rd., Detroit, Mich.
National Lock Washer Co., The, 40 Hermon St., Newark, N. J.
Positive Lock Washer Co., The, Ave A & Miller St., Newark, N. J.
Reliance Mfg. Co., The, Massillon, Ohio.

WASHERS (Lock)—See LOCK WASHERS

WASHING MACHINES & SYSTEMS (Metal)
Drying Systems, Inc., 1814 Foster Ave., Chicago, Ill.

WASHING MATERIAL (Rags)
Ford, The J. B., Co., Wyandotte, Mich.

WATER COOLED EQUIPMENT (For Open Hearth Furnaces)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

WATER FILTRATION & SOFTENING
Scaife, Wm. B., & Sons Co., Oakmont, Pa.

WATER SYSTEMS
Myers, F. E., & Brother Co., The, Ashland, Ohio.

WAX (Core, Wire, Pattern, Vent)
United Compound Co., 288 Elk St., Buffalo, N. Y.

WELDING-ARC (Consulting Engineers)
Kinkead, Robert E., Builders Exchange, Cleveland, O.

WELDING (Forge & Hammer)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh Pa.

WELDING (Oxy-Acetylene, Electric, Alloy)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh.

WELDING AND CUTTING APPARATUS AND SUPPLIES (Electric Arc)
General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Coit Rd. & Kirby Ave., Cleveland.
Motor Repair & Mfg. Co., The, 1549-51 Hamilton Ave., Cleveland, O.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.
Wilson Welder & Metals Co., Wilson Bldg., Hoboken, N. J.

WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene)
Air Reduction Sales Co., 60 E. 42nd St., New York City.
International Oxygen Co., Newark, N. J.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.
Prest-O-Lite Co., Inc., The, 30 E. 42nd St., New York City.

WELDING FLUX—See FLUX

WELDING RODS AND WIRE
Air Reduction Sales Co., 60 E. 42nd St., New York City.
American Brass Co., 25 Broadway, New York City.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Haynes Stellite Co., 30 E. 42nd St., New York City.
Lincoln Electric Co., The, Coit Rd. & Kirby Ave, Cleveland, O.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.
Roebling's, John A., Sons Co., Trenton, N. J.
Washburn Wire Co., Phillipsdale, R. I.
Wilson Welder & Metals Co., Wilson Bldg., Hoboken, N. J.

WHEELS (Car and Locomotive)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

WINDOWS—FIRE PROOF (Hollow Metal)
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

WIRE (Annealed, Bright, Galvanized)
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.

WIRE (Chrome Nickel)
Ludlum Steel Co., Watervliet, N. Y.

WIRE (Fence)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.

WIRE (Music)
Washburn Wire Co., Inc., 118th & Harlem River, New York City.

WIRE (Round, Flat, Square, Special Shapes)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Washburn Wire Co., Inc., 118th & Harlem River, New York City.
Wheeling Steel Corp., Wheeling, W. Va.

WIRE (Threaded)
Progressive Mfg. Co., Torrington, Conn.

WIRE (Welding)—See WELDING RODS

WIRE CLOTH
Cleveland Wire Cloth & Mfg. Co., 3571 E. 78th St., Cleveland, O.

WIRE FORMING MACHINERY
Nilson, A. H., Machine Co., Bridgeport, Conn.

WIRE FORMS AND SPECIALTIES
American Spring & Mfg. Co., Elm St., Holly, Mich.
Cuyahoga Spring Co., 10252 Berea Rd., Cleveland, O.
Titchener, E. H., & Co., Binghamton, N. Y.

WIRE MILL EQUIPMENT
Morgan Construction Co., Worcester, Mass.
Shuster, The F. B., Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.
Vaughn Machinery Co., Cuyahoga Falls, O.

WIRE NAIL MACHINERY
Bliss, E. W., Co., 53rd St., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

WIRE NAILS—See NAILS

WIRE REELS
Nilson, A. H., Machine Co., Bridgeport, Conn.

WIRE ROPE AND FITTINGS
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.

WIRE ROPE SLINGS
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.

WIRE STRAIGHTENERS AND CUTTING MACHINES
Nilson, A. H., Machine Co., Bridgeport, Conn.
Shuster, The F. B., Co., New Haven, Conn.

WIRE, WIRE RODS AND WIRE PRODUCTS
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.

WRENCHES (Drop-Forged)
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

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See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

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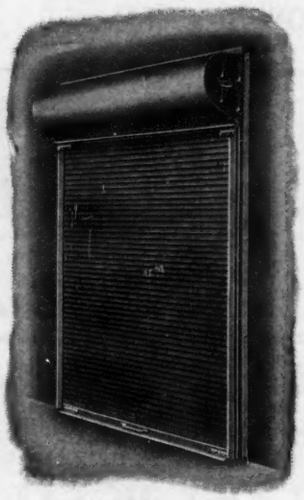

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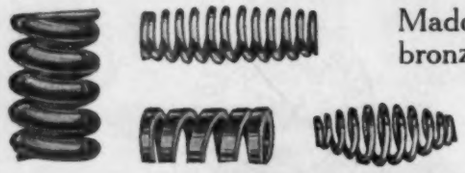

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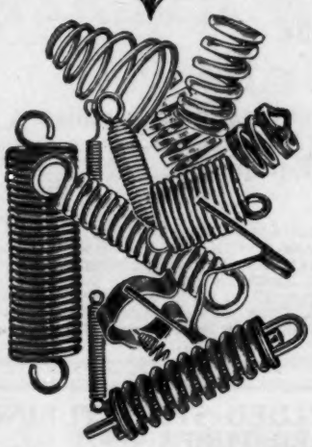

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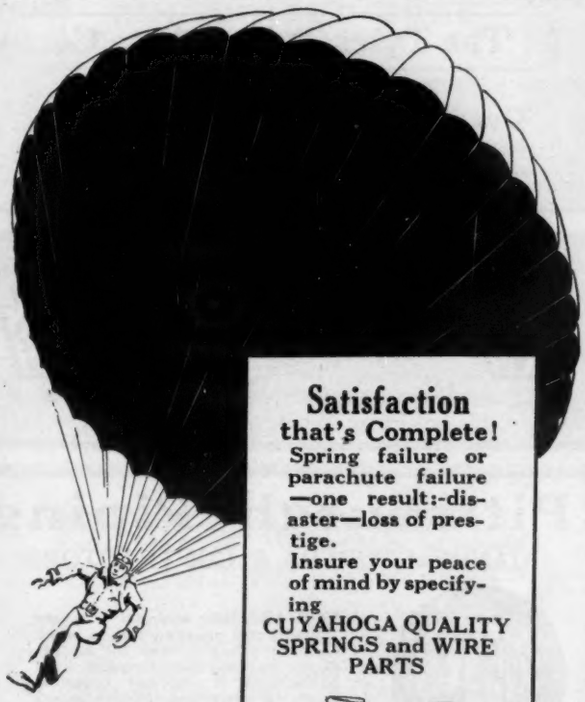

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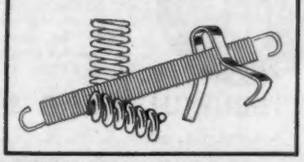

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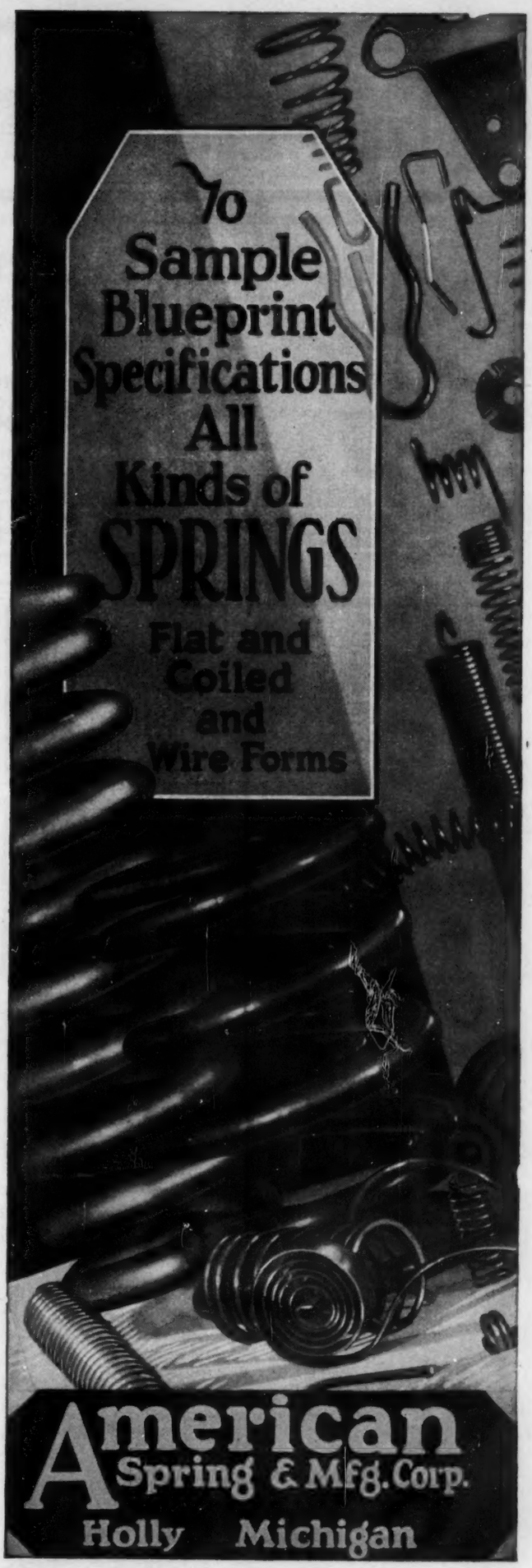
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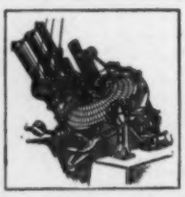

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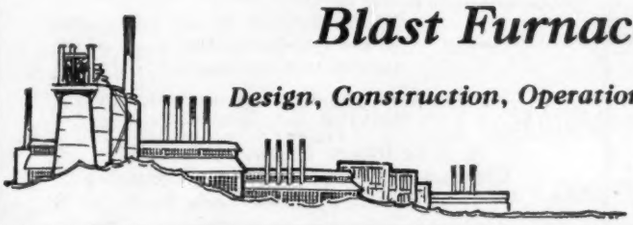

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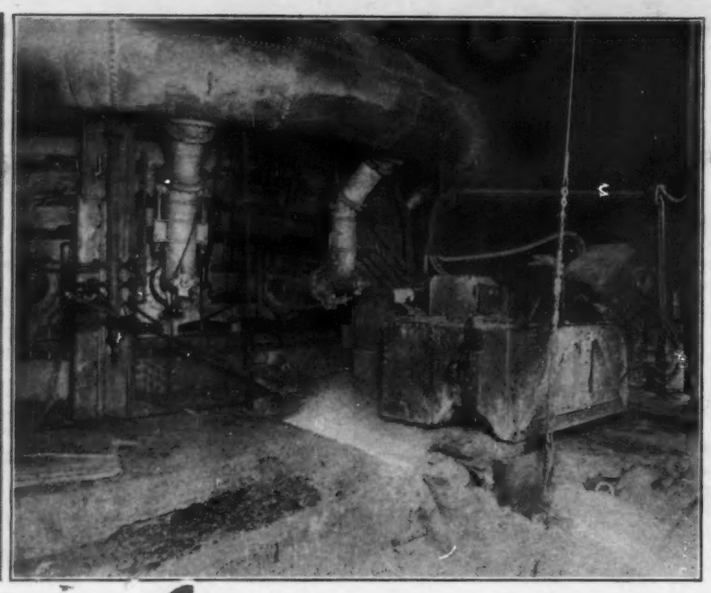

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